The RUBBER AGE

May, 1942

TECHNOLOGY DEPT.

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DETROIT

Materials for use in the

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PLASTICIZING

of the Butadiene Type Synthetic Rubbers

THERMAX "S"

CHANNEL "S"

TYSONITE

for Black Mechanicals and

KALVAN "S"

for light weight, light color
Rubberized Fabrics

R. T. VANDERBILT CO., INC.

230 Park Avenue, New York City

Newsletter No. 5 *PUBLISHED BY RUBBER CHEMICALS DIVISION OF* DU PONT *MAY, 1942*

Accelerator 2-MT and Thermoflex A Extend Life of Rubber in Dynamic Service

WITH THE USE of both crude and reclaimed rubber under drastic restrictions, it is more important than ever before to reduce waste in processing and to produce products that will render the longest possible service life. This latter result can only be obtained through the proper selection and the use of both accelerators and antioxidants. When correctly employed, Accelerator 2-MT gives excellent results in stocks subjected to dynamic service or high temperatures.

ACCELERATOR 2-MT is particularly valuable in developing the best qualities in stocks containing reclaimed rubber. However, to obtain the advantages inherent in 2-MT, it must be properly used. The following principles should be observed in compounding stocks containing reclaimed rubber:

1. Accelerator 808 should be used to activate 2-MT.
2. Sulfur should be used as follows:
   4 parts sulfur per 100 parts reclaimed rubber hydrocarbon
   3 parts sulfur per 100 parts crude rubber hydrocarbon
3. Stearic acid — *at least* 1 part per 100 parts of rubber hydrocarbon should be used.

The outstanding value of 2-MT as an accelerator for tire carcass and belt friction stocks is illustrated by the data in Table I. For comparative purposes, data on guanidine activated thiazole accelerated stocks are also shown.

COMPOUND	A & B	C & D
Smoked Sheets	22.5	11.0
Roll Brown	22.5	11.0
Whole Tire Reclaim	91.5	130.0
Clay	5.0	5.0
Thermoflex A	0.5	0.5
Zinc Oxide	5.0	3.3
Acceleration	**A**	**B**	**C**	**D**
2-MT	—	0.5	—	0.6
ACCELERATOR 808	—	0.12	—	0.15
M.B.T. derivative	0.81	—	0.45	—
Guanidine Type	0.21	—	0.3	—
Sulfur	2.8	3.5	2.8	4.0
Stearic Acid	1.0	2.0	1.0	2.0

TABLE I
Physical Test Data - Cure: 40 Minutes at 287°F.

Compound	A	B	C	D
Original				
Stress at 500% Elong.—psi	1375	1700	—	—
Tensile Strength—psi.	1525	1950	825	1175
Elongation at Break—%	530	530	435	385
Tear Strength—lbs. per in. width	50	75	50	65
Temperature rise on Flexometer* °C.	113	88	108	63
Test time—minutes	20	20	8	8
Time to blow out—minutes	—	—	9	17
Aged in Oxygen at 70°C. and 300 psi for 5 Days				
Tensile Strength—psi	600	950	600	750
Elongation at Break%	305	345	350	255

*Cure: 60 minutes @ 287°

An examination of the data in Table I clearly indicates the superiority of the 2-MT-Accelerator 808 combination in stocks containing reclaimed rubber. The greater tensile and tear strengths and better retention of these properties on aging are typical of reclaim stocks accelerated with 2-MT—Accelerator 808. The improved properties of stocks accelerated with this combination have the added advantage of making it practical to use higher percentages of reclaimed rubber and still meet the requirements of the application. The importance of conserving crude rubber in this way can not be overemphasized in these times. Detailed recommendations and test data are shown in Report 41-1 entitled Accelerator 2-MT. If your copy has been misplaced we should be glad to replace it.

THERMOFLEX A should also be included in stocks that will be exposed to dynamic service conditions. It has long been recognized as the ultimate in flex-cracking antioxidants and it imparts excellent heat resistance. While Thermoflex A has in the past been used principally in the highest quality stocks, it is now important to consider it as a means of protecting and lengthening the life of all products that are exposed to flexing in service.

Through the Mill

COPPER INHIBITOR X-872-A has been proven to be the most effective safeguard against the deleterious catalytic effect of copper on the aging of rubber vulcanizates. To be sure that small amounts of copper do not cause deterioration and reduce the expected service life of your rubber products, we suggest the addition of 0.5% to 1.0% of Copper Inhibitor X-872-A on the rubber in the mix.

COLORS: We have on hand good stocks of dry powder colors and rubber dispersed colors made before the enactment of Order M-15-b. These colors are all available for shipment without restrictions.

INFORMAL REPORTS: The following recently published informal reports are available.

1. *"All-Reclaim Footwear Stocks"*
2. *"All-Reclaim Sponge"*
3. *"A Brick Red Colored All-Reclaim Rubber Stock Suitable for Bulbs and Hollow Balls"*
4. *"All-Reclaimed Rubber Compound for Light Colored Molded Items"*
5. *"Reclaimed Rubber Erasers"*

TIRES: Amendment Number 1 to the War Production Board's Supplementary Order M-15-B-1 specifies the amounts of crude and reclaimed rubber that may be used in the production of tires. In order to conform to the spirit as well as the word of the law it is necessary to build into the tires the best possible quality with the limited amount of rubber permissible.

Suggested compounds for tread and carcass stocks that meet the restrictions of this order on both passenger and truck tires are presented in a timely report entitled "Tread and Carcass Stocks Designed to Meet the War Production Board Restrictions."

RUBBER CHEMICALS DIVISION

Wilmington DU PONT *Delaware*

REG. U. S. PAT. OFF.

THE RUBBER AGE, published monthly by The Palmerton Publishing Co., Inc., Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 250 West 57th Street, New York, N. Y. Entered as second class matter October 20, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $3.00 a year. Canada, $3.50; Foreign, $4.00. May, 1942. Vol. 51, No. 2.

Report from a rubber company that took its own medicine

RAU & GRIFFIN, INC.

Manufacturers of

MOULDED RUBBER GOODS

506 HUNTS POINT AVENUE
NEW YORK

Hycar Chemical Company
Akron, Ohio

Attention: Mr. Frank M. Andrews

Gentlemen:

Among the products we make of Hycar are packing rings for hydraulic pumps. You may be interested in the performance of a set of these rings in one of our own pumps. They have proved themselves far superior to other packings such as hemp, leather, rubber, and other synthetic rubbers.

This pump is run at a speed of 118 RPM, a pressure of 3000 pounds and a temperature of 125° F. It operates 11½ hours a day, five days a week.

Some of the previous packing rings lasted only 10 days, and frequently cut grooves in the pistons, which are expensive replacements. We installed the Hycar rings on August 18, 1941. They were removed on February 22, 1942, after running 1140 hours. In that time the piston had made 8,059,000 strokes -- a very long operating record.

We found piston wear was negligible, so we simply installed new Hycar rings with the old pistons and the pump has been running ever since without any leakage whatever.

If this achievement of Hycar is of any interest and can be passed on where it may be of value to others, you are welcome to use it.

Rau & Griffin, Inc.

Treasurer.

HYCAR Chemical Company
AKRON, OHIO

Priorities and Preference

We are grateful for having received more preference than priorities from our customers for Zinc Oxide. One is earned; the other is mandatory. We shall continue to strive by quality, service and understanding of customers' needs to justify the preference extended to us.

ST. JOSEPH LEAD COMPANY
250 PARK AVENUE, NEW YORK, N. Y.

MADE BY THE LARGEST PRODUCER OF LEAD IN THE UNITED STATES

FOLLOW THE SIGNS TO CYANAMID

for high quality in rubber chemicals and specialties, and for prompt service from strategically located warehouses.

Sales Representatives to the Rubber Industry and stock points: Ernest Jacoby & Company, Boston, Mass.; H. M. Royal, Inc., Trenton, N. J., and Los Angeles, Cal.; Herron & Meyer, Chicago, Ill.; Akron Chemical Company, Akron, Ohio.

AMERICAN CYANAMID & CHEMICAL CORPORATION

A Unit of American Cyanamid Company

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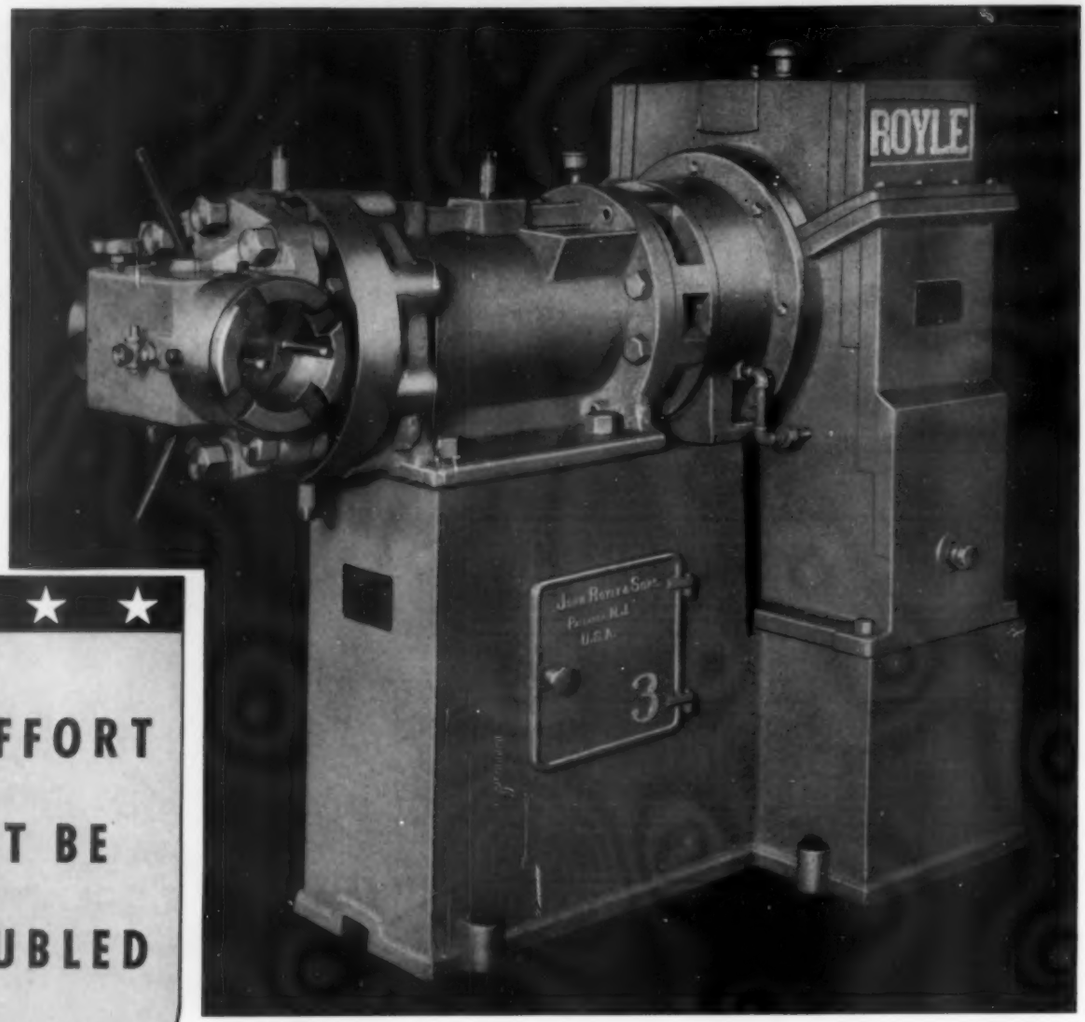

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THE EFFORT MUST BE REDOUBLED

From small and humble beginnings, America has grown. Today she is the greatest industrial nation in the world. Like the courageous pioneers who accepted every challenge with redoubled effort—we too must multiply our output.

Today, America is again pioneering. Pioneering to make herself strong. John Royle & Sons is proud to be a part of a pioneering industry that accepts the challenge of making more and better products, both for civilian and defense needs.

Advancements and improvements in production occur everyday. They will benefit you and enable us to serve you better when the emergency is over. But until that day, your patience and understanding are needed.

John Royle & Sons *Since 1855*

ROYLE PATERSON N J

AKRON, J. C. CLINEFELTER • • LONDON, JAMES DAY (MACHINERY) LTD.

ROYLE'S 62 ND. YEAR OF EXTRUDING MACHINE MANUFACTURE

MAKE THE MOST OF WHAT YOU'VE GOT..BY USING C-100 ALUMINAS

Rubber, vital for war uses, goes farther when C-700 Aluminas are the reinforcing pigments; some stocks employ less rubber and finished products last longer. The rubber has superior aging characteristics. It has high strength at elevated temperatures.

You'll find that it also has good resistance to abrasion, unusually high resistance to hot and cold tear, low heat build-up and good heat transfer. It has good dielectric properties.

The rubber is low in specific gravity and has high modulus with high elasticity. You get unusually good tackiness of the uncured stock, and high resilience and rubbery properties with high pigment loading.

ALUMINUM COMPANY OF AMERICA
(*Sales Agent* for ALUMINUM ORE COMPANY)
1970 Gulf Building, Pittsburgh, Penna.

Reg. U. S. ALORCO Pat. Off.

ALUMINUM ORE COMPANY

ALUMINUM AND FLUORINE COMPOUNDS

1861 . . . BULL RUN, the Battle that Woke the North

At Bull Run, a little stream just above Manassas, some 30,000 raw, undisciplined Union troops met an equal number of almost equally raw Southerners. All day long the battle raged, until near dusk a Confederate bayonet charge broke the Union lines and sent them fleeing back toward Washington. The defeat brought realization that this was no "30-day war."

EVER since the world began, perfection has been reached through trial and error—by learning, from defeat, the secrets of victory.

There are many parallels in industry. The problems of manufacturing a perfect Carbon Black, for instance, were not easily overcome. But today ATLANTIC CARBON BLACKS are known for precision-quality...and that is why they have been chosen by some of the greatest names in the rubber industry.

ATLANTIC CARBON BLACK

MANUFACTURED BY

CHARLES ENEU Johnson AND COMPANY

DISTRIBUTED BY

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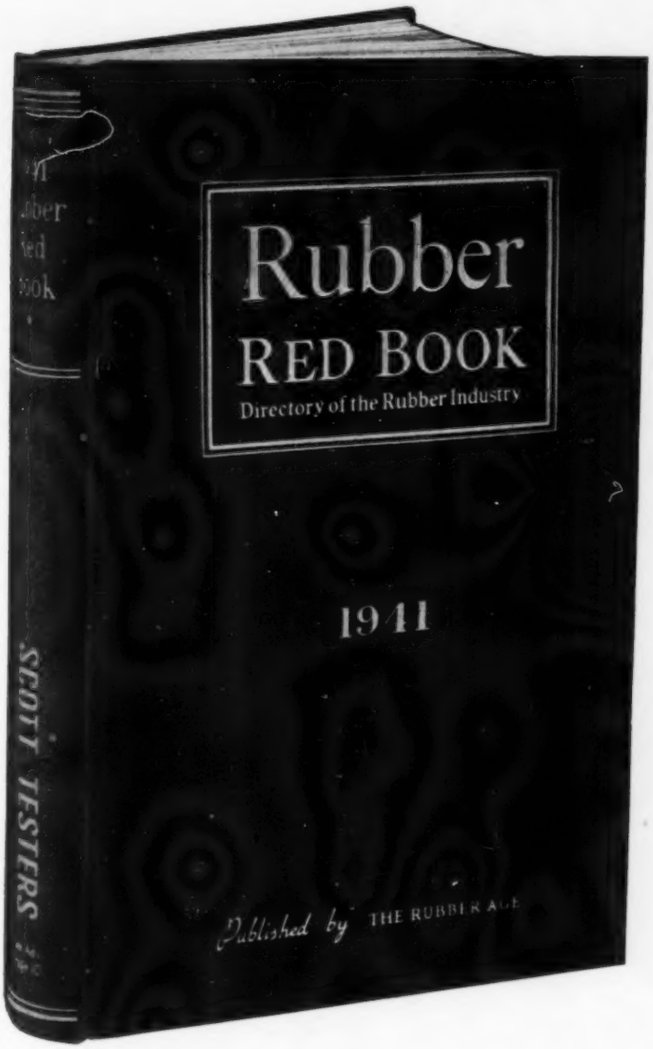

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New cover of latex-bonded fibre with leather finish which will withstand constant handling

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Published by

THE RUBBER AGE
250 West 57th Street
New York, N. Y.

The INDISPENSABLE REFERENCE BOOK for Rubber Manufacturers, Suppliers, etc....

To rubber factory executives, purchasing agents, technologists, etc., the RUBBER RED BOOK furnishes complete and handy lists of suppliers of all kinds of materials, equipment and services classified for easy reference. This is a service which saves buyers much time and effort as in no other directory are such lists available.

Suppliers and their salesmen, on the other hand, find the RUBBER RED BOOK invaluable for its complete and accurate listing of rubber manufacturers in the United States and Canada with such data as size of company, type of products made, names of buyers and other executives, etc. Also included is a geographical breakdown of rubber manufacturers in the United States showing all companies in each city and town. This feature enables salesmen to be certain that no prospect is overlooked.

No matter what position you hold in the rubber industry—factory executive, purchasing agent, chemist, technologist; supplier of machinery, chemicals, rubber, or other materials; librarian; consultant; salesman or user of rubber products—you should have a personal copy of the 1941 RUBBER RED BOOK on your desk or in your brief case ready to give an immediate answer to the thousand and one questions which crop up constantly, particularly during these critical days when accurate information is so essential.

Summary of Contents 1941 RUBBER RED BOOK

RUBBER MANUFACTURERS IN THE UNITED STATES
Alphabetical Section; Classified List of Rubber Products; Geographical Section.

RUBBER MANUFACTURERS IN CANADA

RUBBER MACHINERY AND EQUIPMENT
Classified List of Machinery; Machinery Manufacturers and Addresses

ACCESSORIES AND FITTINGS
Classified Lists of Products; Suppliers and Addresses

RUBBER CHEMICALS AND COMPOUNDING MATERIALS
Classified List of Materials; Trade and Brand Names; Suppliers and Addresses

FABRICS AND TEXTILES
Classified List of Materials; Suppliers and Addresses

CRUDE RUBBER AND RELATED MATERIALS
Classified List; Suppliers and Addresses

SYNTHETIC RUBBER AND OTHER RUBBER-LIKE MATERIALS

RECLAIMED RUBBER
Manufacturers and Addresses; Methods of Manufacture; Statistics (1919-1940)

SCRAP RUBBER DEALERS

RUBBER DERIVATIVES

RUBBER LATEX
Latex and Latex Compounds; Water Dispersions; Special Latex Processes; Latex Compounding Materials; Latex Machinery and Equipment

MISCELLANEOUS PRODUCTS AND SERVICES
Backing for Camelback; Cork Products, Wax Crayons; Decalcomania Transfers; Scrap Rubber Grinding; Inks for Printing on Rubber; Rubber Labels; Master Batches; Liner Compounds; Liners Processed; Processed Liners; Processed Paper

CONSULTING TECHNOLOGISTS

MANUFACTURER'S SALES AGENTS, BRANCH OFFICES, ETC.
In the United States; In Canada

TECHNICAL JOURNALS

TRADE AND TECHNICAL ORGANIZATIONS

WHO'S WHO IN THE RUBBER INDUSTRY

SUBJECT INDEX

USE ATTACHED CONVENIENT ORDER FORM

..... 19.....

THE RUBBER AGE
250 West 57th St., New York

Kindly send ..... copies of the 1941 RUBBER RED BOOK at $..... each to the undersigned:

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THE ROLE OF MICRONEX IN NATURAL RUBBER HAS BEEN ESSENTIAL

. . . WITH SYNTHETIC RUBBER IT WILL BE *Predominant*

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MICRONEX

Beads or Compressed

A COLUMBIAN COLLOID

BINNEY & SMITH CO. • COLUMBIAN CARBON CO.

DISTRIBUTOR MANUFACTURER

The New Role of MICRONEX

WITH synthetic rubbers, differences in Carbon Black become more sharply pronounced. Variations of minor importance in relation to natural rubber stand out distinctly with Buna S.

For the future the possibilities of the Micronex range take on a new significance. The number of types available and the care with which each special type is controlled provide assurance that emergency requirements are anticipated.

•

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DISTRIBUTOR

COLUMBIAN CARBON CO.
MANUFACTURER

TO HELP CONSERVE AMERICA'S RUBBER SUPPLY!

• Because they can be used equally well with reclaim or crude rubber stocks, Barrett's "Carbonex*S" flakes are becoming increasingly important in the conservation of America's vital rubber supplies. This coal-tar compounding material by imparting increased resistance to wear and cutting has proved of great value in tank tread blocks. But this is only one of the significant properties of "Carbonex S" users find of value.

Extender—5 to 10% on the rubber hydrocarbon to conserve crude rubber.

Reinforcing Softener—A highly practical control of toughness.

Rapid Extrusion—Minimizes swelling and lessens sagging and flattening.

Improves Tear Resistance—An important factor to increase wear.

Improves Molding—Imparts a high finish for longer wear.

Promotes Better Processing—Calendering and extruding properties are greatly improved.

Excellent Aging Qualities—A final great help in rubber conservation!

The research staff of the Barrett rubber laboratory will be glad to cooperate with you in the use of Carbonex S and other Barrett rubber compounding materials to meet your requirements. Wire or write today for full information.

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK

One of America's Great Basic Businesses

*Trademark Reg. U. S. Pat. Off.

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Barrett

The Sensational New

VULCANIZER INTERIOR PAINT

WILL RESIST
- ACID ACTION
- ABRASION
- HEAT
- OXIDATION

SAVE YOUR VULCANIZERS with *Bonnejohn Vulcanizer Interior Paint* an insoluble coating that gives lasting protection to fittings and vulcanizer interior surfaces.

Its formula represents the results of scientific experiments and contains materials that minimize sulphurous fumes and acid action as well as being anti-corrosive under high steam pressure.

Can be applied with a brush, spreads easily, has exceptional long lasting and adhesive qualities, seals perfectly requiring no preliminary preparation other than having surfaces clean before painting.

Recommended for carts, hangers, and door mechanism or any equipment used in the interior of vulcanizers, or any place in your plant where equipment needs protection against extreme corrosion.

Comes in black only .....$9.75 per gallon.

BELKE MANUFACTURING CO.
947 N. CICERO AVE. CHICAGO

TAKE A TIP

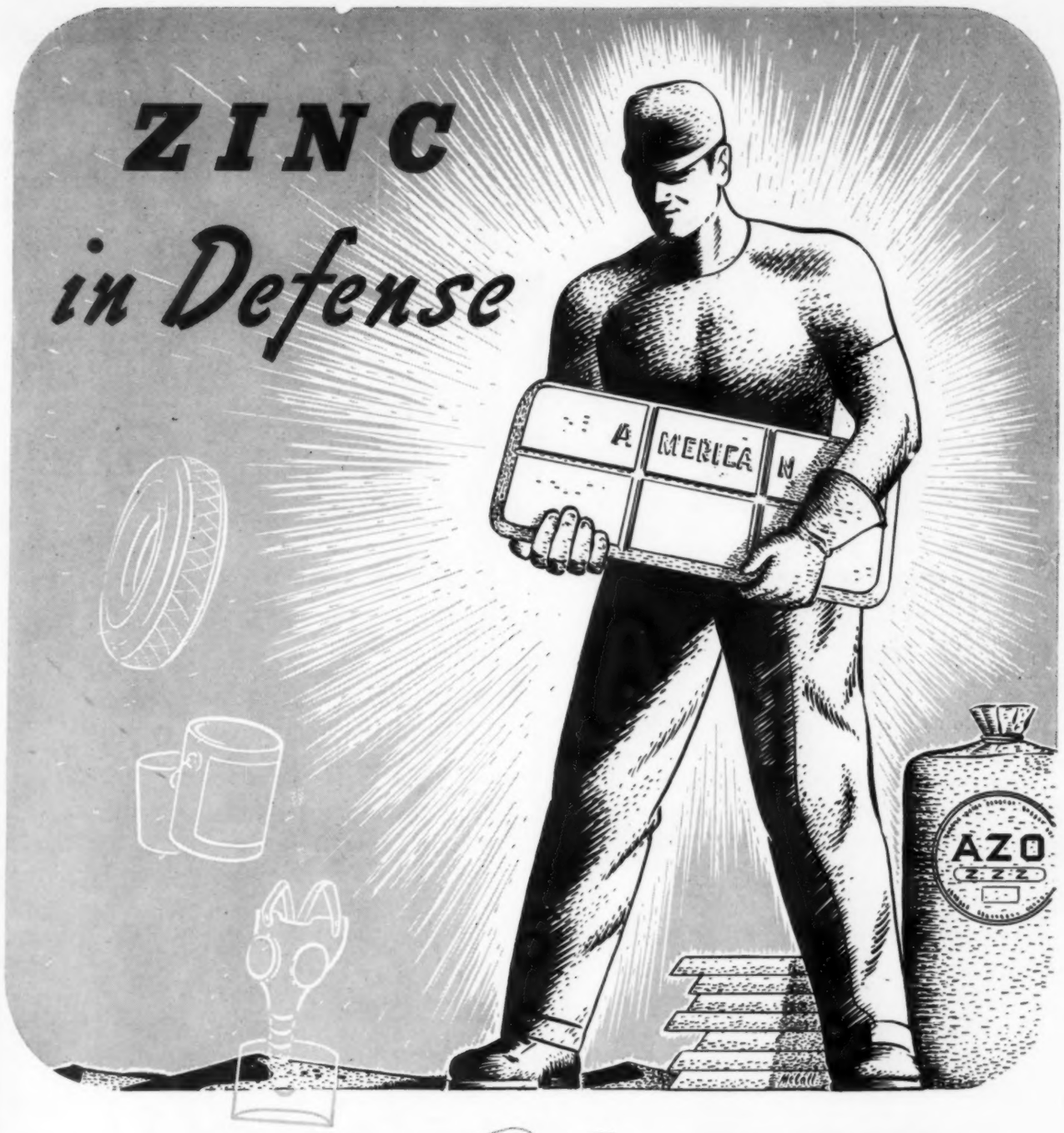
Whatever your production schedule calls for today — whatever your plans for the future, exacting requirements will be imposed . . . These requirements can best be met with needed exactness in the Standard Line. For in Standard is *Precision* assuring dependable uniformity in the compounding and handling of —

SYNTHETIC RE-CLAIMED or NATURAL Rubbers

Standard has a complete line for all needs of compounding — and to facilitate the handling of compounds.

STANDARD
Chemical Company
AKRON SAVINGS AND LOAN BLDG. AKRON, OHIO

ZINC in Defense



In a thousand ways zinc is vital to the nation's defense program. The brass for shells is one-third zinc. Alloyed with aluminum, zinc helps build airplanes. The zinc which covers galvanized metal equipment protects it from rust and corrosion. In sheet form zinc makes batteries and boiler plates. Zinc oxides are vital in the manufacture of rubber tires, gas masks, paint products, and many other defense items.

Though defense comes first, the American Zinc industry is employing every available facility in an "all out" effort to satisfy the unprecedented demand for every zinc product.

AZO ZINC OXIDES

AMERICAN ZINC SALES CO.

Distributors for

American Zinc, Lead & Smelting Co.

Columbus, O., Chicago, St. Louis, New York

CAPITOL PROCESS

— Economical
— Efficient

LINER TREATMENT

•

Cotton piece goods are most economically and efficiently rendered repellent to adhesion of rubber stocks by the *Capitol Process of Liner Treatment.* It is a low cost process which not only gives fabrics non-sticking properties but long life as well.

Should your stocks require no *specially treated* liners to prevent adhesion, our processing of the fabrics you now use will lengthen the duration of their usefulness many times over and create an important reduction in your purchases of cotton piece goods which is now so vital to our total War effort.

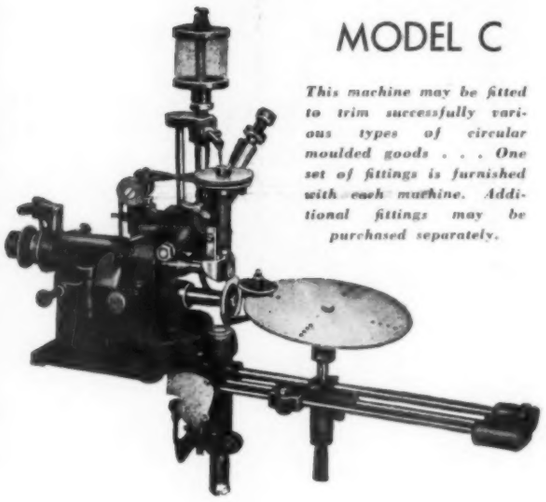
Try the CAPITOL PROCESS on your next order of Rubber Repellent Liners.

•

TEXTILE PROOFERS, INC.
ONE GATES AVENUE
JERSEY CITY, N. J.

USMC TRIMMING MACHINE

MODEL C

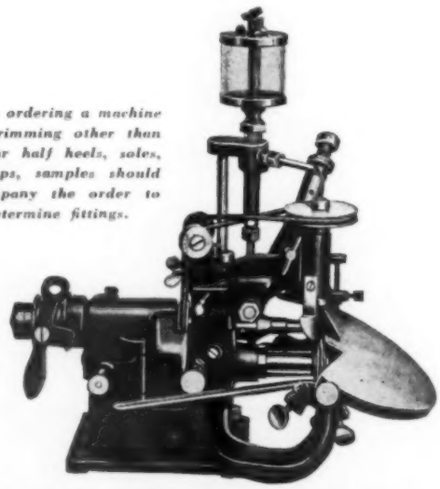


This machine may be fitted to trim successfully various types of circular moulded goods . . . One set of fittings is furnished with each machine. Additional fittings may be purchased separately.

A new and improved machine for trimming the overflow on all types of moulded rubber heels, soles, taps, and miscellaneous moulded rubber goods of similar construction.

Oil is the standard means of lubrication. A water tank is shipped, only when specifically ordered, at an extra charge.

When ordering a machine for trimming other than regular half heels, soles, or taps, samples should accompany the order to determine fittings.



UNITED SHOE MACHINERY CORPORATION

140 Federal Street, Boston, Mass.

Atlanta, Ga...29½ Prior N.E.
Auburn, Maine.....108 Court
Brockton, Mass.....93 Centre
Chicago, Ill...300 So. Franklin
Cincinnati, O...407 East Eighth
Haverhill, Mass.....145 Essex
Johnson City, N. Y.
19 Jennison Ave.
Lynn, Mass.....525 Union
Milwaukee, Wis..922 N. Fourth
New York, N. Y., 110 Fifth Ave.
Philadelphia, Pa., 221 No. 13th
Rochester, N. Y.....130 Mill
St. Louis, Mo.....1423 Olive
San Francisco, Cal., 859 Mission
Worcester, Mass...71 Mechanic

A New Carbon Black
Assuring Lower Heat Generation
CONTINENTAL "AA"
For Military, Bus and Truck Tires

To meet today's urgent need for a carbon black which provides the best balance between wear resistance and heat generation, Continental Carbon Company has developed Continental "AA" for military, bus and truck tires.

Low heat generation has been assured in this new black by thorough tests on special machines in Continental's laboratory. And, in addition, Continental "AA" is easier processing than the standard grades formerly furnished for passenger car tire use.

The modern methods and strict laboratory control used in the production of Continental "AA" are your assurance of the same high quality that characterizes all other grades of Continental Blacks.

But test this new black *yourself*. Samples of Continental "AA" will gladly be sent on request.

Continental

CONTINENTAL CARBON COMPANY
295 MADISON AVENUE · NEW YORK, N. Y.
Akron Sales Office: Peoples Bank Building, Akron, Ohio
Sales Representatives: Ernest Jacoby & Co., Boston, Mass.
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COMMERCIAL RUBBERMAKERS' SULPHUR • **REFINED RUBBERMAKERS' SULPHUR**

TIRE BRAND, 99½% PURE • **TUBE BRAND, 100% PURE**

CRYSTEX (INSOLUBLE) SULPHUR

SULPHUR CHLORIDE — CAUSTIC SODA

CARBON BISULPHIDE — CARBON TETRACHLORIDE

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FREEPORT, TEXAS — APOPKA, FLORIDA — 424 OHIO BUILDING, AKRON, OHIO

SOLVING PRODUCT PROBLEMS

for... COSMETIC • PAINT • RUBBER and Allied Manufacturers

Shortages—Seller's Market—Substitutes. These are by-words in industry today. The product problems of manufacturers are many. When brought to us, we give each and every need careful and sincere attention. A new friend now may be a real friend for years.

As a source for talcs, clays and pigments for over fifty years, good service and satisfied customers have placed us in the high position we are in today.

With the diminishing of available raw materials, we must keep faith with our regular clients and new ones who seek us out.

Our Research Department is giving increased time and effort to find suitable alternatives for unobtainable products, not forgetting that

QUALITY IS OUR FIRST CONSIDERATION.

Quality is our first consideration

CHICAGO: Henry Holland & Sons

PHILADELPHIA: Peltz & Company

TORONTO: Richardson Agencies, Ltd.

WHITTAKER, CLARK & DANIELS, INC.

260 WEST BROADWAY • NEW YORK CITY

2451

Help Assure Victory!

COLLECT MORE AND
DELIVER MORE... *Now!*
YOUR SCRAP RUBBER
CAN DO IT

H. MUEHLSTEIN & CO., INC.

122 E. 42nd STREET, NEW YORK, N.Y.

AKRON CHICAGO BOSTON LOS ANGELES MEMPHIS LONDON

SCRAP RUBBER

55 INQUIRIES *from a single advertisement* in RUBBER AGE

AMERICAN RESINOUS CHEMICALS CORPORATION

Coatings • Pigment Dispersions • Resin, Wax, Lacquer Emulsions

PEABODY MASS NEWARK N J CHICAGO ILL

CABLE ADDRESS RESCHEM
PEABODY, MASS., U. S. A.

April 24, 1942

The Rubber Age
250 West 57th Street,
New York, N. Y.

Attention: Mr. Peter P. Pinto

Dear Mr. Pinto:

We wish to acknowledge the results of our advertisement in the March issue of "The Rubber Age".

To date we have received approximately fifty-five inquiries directly mentioning our advertisement. Many companies have been particularly interested in our latex extenders and substitutes for use in shoe adhesives, paper lamination and impregnation, coating for textiles to confer grease-proofing, water-proofing, and mustard gas resisting properties, etc. There has also been an increased demand for our new resin extenders for crude rubber and reclaimed rubber.

We are indeed pleased with the results obtained from our advertisement in your magazine.

Very truly yours,

AMERICAN RESINOUS CHEMICALS CORP.

William Lewis

WILLIAM LEWIS

WL:VK

Here is a reproduction of the letter from American Resinous Chemicals Corp. of Peabody, Mass., telling of the results obtained from their page advertisement on the back cover of the March, 1942 issue of RUBBER AGE.

This is one of many similar experiences of advertisers who have found out how thoroughly rubber factory purchasing agents and technologists read RUBBER AGE — and how responsive they are to the messages of advertisers in its pages.

Today rubber factories are up against the necessity of locating new and substitute materials and processes to meet war-time conditions. Accordingly purchasing agents and technologists are reading their technical journals more closely than ever before and if your products can help them meet this need your advertisement in RUBBER AGE will bring a ready response as proven time and time again.

What RUBBER AGE did for this advertiser it can do for any supplier whose products can be used in the rubber industry. Plan now on being represented with space in the next issue. Write today for rates.

THE RUBBER AGE

250 West 57th Street, New York, N. Y.

CALLED FOR SERVICE

Here is how the bead looks as it is removed from the tire.

This Tire Has Served You Well, Now It Will Serve Uncle Sam

Too old for civilian use. This tire rates A-1A for reclaim used in insulating wire. Starting its journey through the plant of the Pequanoc Rubber Co., it and thousands of others begin a new career of service.

AURORA

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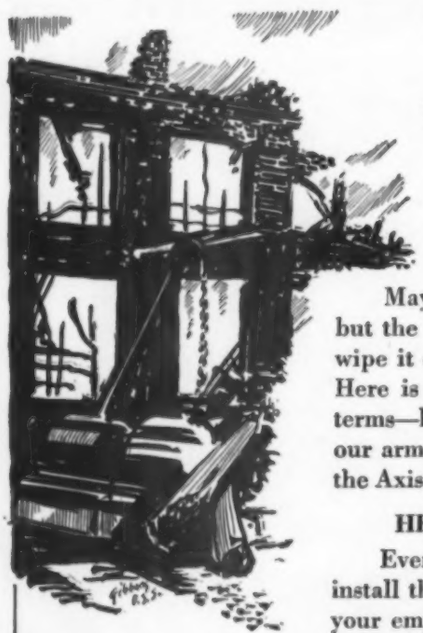

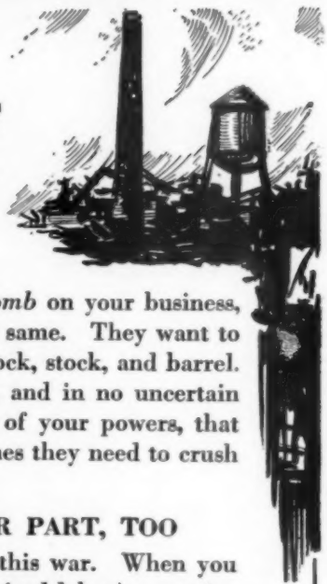

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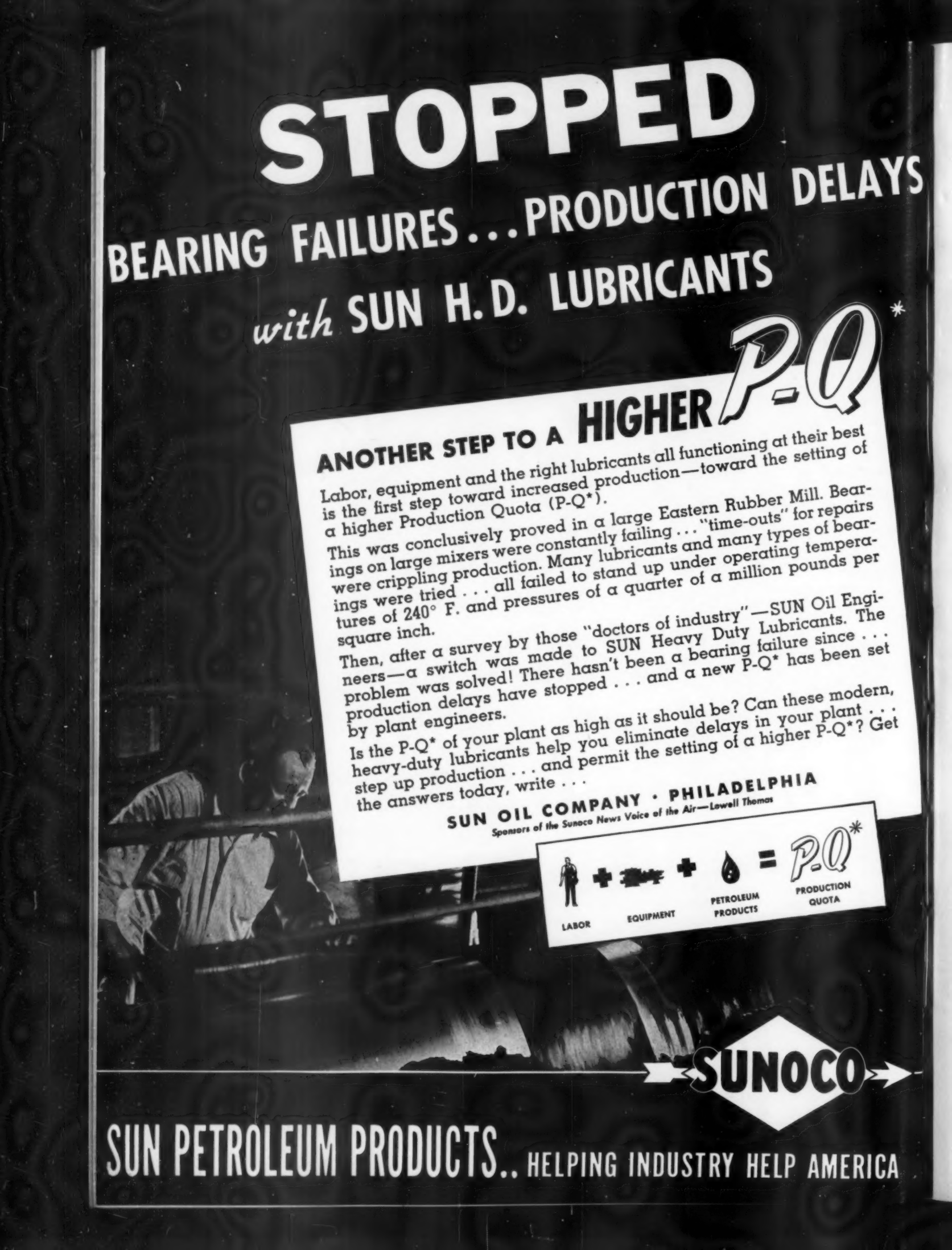

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The **RUBBER AGE**

VOL. 51, No. 2 **MAY, 1942**

Properties of Citrus Pectates and Pectin and their Relation to the Rubber Industry

By C. W. WILSON

Research Dept., California Fruit Growers Exchange, Ontario, California

PECTIC substances are widely distributed in plant tissues and have been shown to be present in fruits, leaves, tubers, meristematic tissue and lignified tissue. The part played by pectin in the preparation of fruit jellies and jams has led to its manufacture in large quantities. No attempts to commercialize other pectic substances have been made until recently.

Pectin occurs in an insoluble form (called protopectin) in the white part of the peel of citrus fruits. It may be extracted therefrom by treatment with hot dilute acids, and after filtration may be recovered as a white or nearly white solid by addition of alcohol or colloidal aluminum hydroxide *(1)*.

Pectin consists chiefly of methyl esters of polymerized galacturonic acid. By treatment with cold dilute alkali (sodium hydroxide), the methyl groups are split off, the degree of polymerization is somewhat reduced and other as yet unknown changes probably take place, and a pectate is formed. The alkali metal pectates yield moderately viscous sols with water. The alkaline earth and heavy metal pectates are insoluble gels.

If protopectin is treated with an alkali, a pectate results whose alkaline earth and heavy metal salts are likewise insoluble gels, but whose alkali salt solutions are highly viscous *(2)*. Because these sols yield precipitates with alcohol that are in the form of visible fibers, in contradistinction to the granular gel precipitated from sols of the previously described pectate, the term "fibrous pectates" is often used to designate them, though the descriptive term "viscous type" is probably to be preferred.

If pectin or protopectin be added to hot alkaline solutions low viscosity degradation products result, but the viscous pectates may be boiled with mildly alkaline solutions without apparent change. Figure 1 shows the relationship of the various pectic substances discussed.

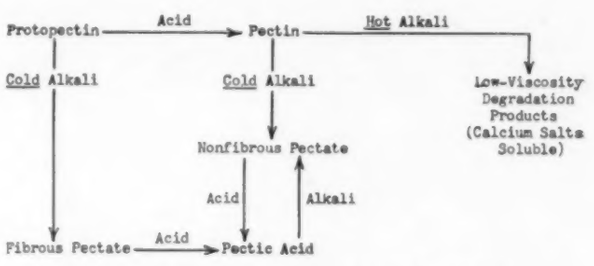

FIG. 1—Relation of Pectic Substances.

Properties and Commercial Availability

Pectin—Because by far the larger proportion of pectin enters into the manufacture of jams and jellies, and because the ability of pectins to form gels varies with the maturity of the fruit and the conditions of extraction, it is customary to market it mixed with varying amounts of a sugar to supply a material of constant gelling power. Unsugared pectin is available for special purposes.

Non-Fibrous Pectates—These may be prepared from commercially available pectic acid by either one of two methods. If the pectate is soluble (*e. g.*, sodium, ammonium, triethanolamine, etc.), direct action of the carbonate, hydroxide or free base on the acid may be employed. For example, the most convenient method of preparing sodium pectate is to mix:

Pectic Acid	5 parts
Sodium Carbonate	1 part
Water	sufficient to moisten

After the reaction is over, as indicated by cessation of effervescence, hot water to make 100 parts may be added.

Insoluble pectates may be precipitated from such a sol by the addition of a slight excess of a solution of a suitable metallic salt such as calcium chloride to form calcium pectate, copper sulfate to form cupric pectate, etc. The pectates of the alkali metals, ammonia and the organic bases, as already indicated, are water-soluble. Other pectates are insoluble.

Pectic substances, generally, are precipitated from aqueous solutions by the addition of alcohol. The pectates of the organic bases become increasingly difficult to precipitate as the size of the basic radical is increased. Trimethyl benzyl ammonium pectate is soluble in alcohol.*

Pectate Pulp—This is a crude material containing 30-35% of viscous pectate in an insoluble form. A suitable method of bringing the pectate into solution follows:

Pectate Pulp	2. %
Tetrasodium Pyrophosphate (anhydrous basis)	0.1%
Sodium Carbonate	0.1%
Boiling Water	97.8%

The mixture should be boiled for 3 to 4 minutes to solubilize the pectate, and then, because the pectate is between the cells and also a constituent of the cell walls, thorough disintegration is necessary for efficient extraction. In the laboratory we use a malted milk mixer, and for larger scale work a centrifugal pump has proved very satisfactory. This dispersion will be a viscous liquid after cooling, and will contain the cellulosic matter of the original pulp in suspension.

Pectate pulp is marketed in bags of 100 pounds each and furnishes a cheap source of the high viscosity pectate. The dispersing materials are not ordinarily mixed with the pulp, since the user can usually buy these closer to his plant and save freight. Samples are, however, generally submitted with the dispersing agents added in proper amounts. Such mixtures are referred to as "dispersible mixtures," and save considerable time for the technical man since all that is required for dispersion is the addition of the hot water, boiling, and agitating.

* Trimethyl benzyl ammonium hydroxide is known as "Triton B."

Sodium Pectate (viscous type)—The above crude sol will contain this pectate and, if the suspended cellulose would interfere with the intended use, either of two methods of obtaining a purer product may be followed. The first would be to prepare a pulp dispersion at the point of use and filter or centrifuge to remove the suspended matter. This clear but still impure sol will be found suitable for many uses.

If greater purity is required, a clarified sol, such as the above, may be treated with alcohol to remove the pectate which may then be washed with additional alcohol, dried and ground. To be economically sound, alcohol used in this process must be recovered and this necessitates carrying out the procedure at the place of production of the pulp.

Purified pectate like that described above is not yet a commercial article, but is being made in semi-commercial lots in a pilot plant. If need for this material becomes evident, production can be rapidly expanded.

Uses of the Pectates

Latex Creaming—According to Marchionna *(3)* the first observation that rubber latex could be separated into a rubber rich upper layer and a lean lower layer was made by Faraday in 1825-26. Whitby *(4)* collated the work of several investigators and showed creaming to result from incipient coagulation, and described reversible creaming brought about by the addition of a limited amount of a coagulating agent.

Traube *(5)* rendered this reversible creaming more practical by describing many substances capable of causing it.

Schweitzer *(6)* extended the studies in this field and maintained that the difference between the lack of activity of starch and the activity of certain starch derivatives was due to the association of the starch molecules, in aqueous dispersion, pointing out that the active substances are molecularly dispersed.

Bondy *(7)* showed that a creaming agent need not be adsorbed by the rubber particles and suggested that creaming agents operate by dehydrating the adsorbed protein. Hauser and Dewey *(8)*, as a result of the study of the effect of creaming agents on serum viscosity, ascribed the effect of destabilization to the emulsifiers present in the serum.

Low viscosity pectates (from cold alkaline treatment of pectins) are not particularly good creaming agents. This is probably due to the low molecular weight. The viscous pectates, on the other hand, are excellent creaming agents *(9)*.

Figure II outlines a scheme for utilizing crude pectate pulp as a creaming agent. The quantity of pectate pulp used was 0.50% on latex, equivalent to 0.16% of actual sodium pectate.

The mixture was heated to 60° C. and held at this temperature until centrifuging was complete. The relatively mild centrifugal force employed in this work (a cream separator) was used to hasten the separation that would have taken place by gravity. Reduction of required tank capacities and of material in process would seem to amply justify the use of the accelerated system, and removal of small particles of solids would be an added advantage.

The cellulose was deposited in the bowl of the centrifuge and a clean cream having a rubber per cent total solids of 98.46 was produced. Gravity separation of the serum was rapid to the concentration shown in the

figure at which concentration it may be returned for reprocessing without appreciably altering the composition of the feed.

Slower feed, higher centrifugal force or a larger machine would give a lower concentration of rubber in the skim effluent, but would not appreciably alter the composition of the final discard serum.

Thickening of Latex—Three approaches to the thickening of latex by use of the pectic substances are possible.

The first takes advantage of the viscous nature of pectates (the "fibrous" pectates particularly) and merely requires the addition of these materials, preferably dissolved in water, to the latex until the desired viscosity is obtained. When the fibrous pectate was used as the thickener, the mixture resisted coagulation (2.8 cm steel ball in a 3.0 cm tube operating at 36 strokes per minute) for 36 hours. A latex that had been thickened with sodium alginate accumulated several grams of coagulum in the ends of the tube during this time.

A second approach is by addition of a soluble pectate followed by some substance that will cause gelation of the pectate such as salts of calcium, aluminum, zinc, etc. If the quantity of the metallic ion added be kept below that required for complete precipitation of the pectate, and if local overconcentration be avoided by rapid agitation during this compounding, the latex will be thickened but not destabilized:

Sodium Pectate (Viscous Type) ....0.2 g
Water .....20 ml

After the solution was complete,

Latex .....80 ml

was added, and then, with rapid stirring a solution of calcium chloride,

$CaCl_2$ .....0.025 g
Water .....3 ml

The third method depends upon conversion of pectin to a pectate in the presence of the ammonium hydroxide normally present in preserved latex. The pectin is soluble in the presence of calcium ions, but the pectate forms a gel therewith. An example of this type of thickening follows:

	Parts by Weight
Pectin	3.8
Calcium Acetate · 2 H_2O	1.2
Water	95.0

The calcium acetate is mixed with the dry pectin which is then moistened with a small amount of alcohol and the water added rapidly with stirring. One volume of such a mixture will form a paste with 8 to 10 volumes of ammonia preserved latex after standing overnight. None of these thickened products are stringy.

Pigments—The soluble pectates are excellent protective colloids for most of the pigments. Pigments that normally coagulate latex may be suspended in dilute pectate sols and these suspensions added to the latex. An example of this type of pigment dispersion follows:

Pectic Acid (low viscosity)	2.0 g
Ammonium Carbonate	0.4 g
Hot Water to make	200.0 g

The pectic acid and the ammonium carbonate were mixed dry and moistened with a small amount of the water. When effervescence had ceased the rest of the water was added and the reaction adjusted to near neutrality by judicious addition of ammonium hydroxide. The pectate sol was ground with 35 g of carbon black and the dispersion added to a liter of latex.

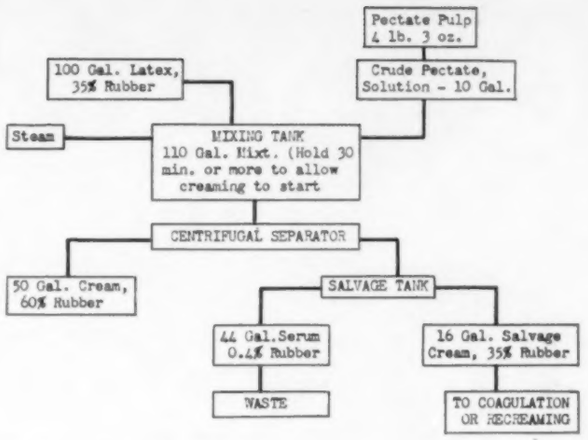

FIG. 2—Creaming of Rubber Latex with Pectate Pulp.

Pectates are not suited to the stabilization of such pigments as satin white, gypsum, etc., that are appreciably soluble and hence form insoluble pectates.

Another method of forming pigments in an extremely fine state of division, and compatible with latex, involves precipitation of the pigment in the presence of a pectate. A novel method of accomplishing this is illustrated by the following method of preparing lead chromate:

Sodium Pectate .....2.5 g
Water (hot) .....300 ml

To this solution was added slowly and with stirring a solution

Lead Nitrate (anhydrous basis) ....1.37 g
Water .....300 ml

The precipitate of lead pectate was suspended in boiling water, pressed and washed by percolating with water.

The purified lead pectate was suspended in 300 ml of water and decomposed by addition of a solution of potassium chromate:

Potassium Chromate .....1.0 g
Water .....25 ml

Insoluble lead chromate in an extremely fine state of division was formed at the same time as soluble potassium pectate. The pectate may again be precipitated with lead nitrate. The lead pectate gel will quantitatively remove the lead chromate from suspension. The precipitate may be washed to remove the potassium nitrate formed in the precipitation, and the decomposition with potassium chromate repeated. This has been carried out four times without apparently affecting the stability of the suspension, each time increasing the quantity of pigment compared to that of pectate.

Addition of pectate protected carbon suspensions to latex would not be expected to show any reinforcing effect on the resulting rubber, but could furnish a means of adding carbon at the plantation which would be homogeneously included in the crude rubber after precipitation, requiring only a short milling to develop the full effect.

Sponge Rubber—Twiss and McCowan *(10)* have described a process for making sponge rubber that consists in coagulating a compounded latex about gel particles and vulcanizing. If the gel is liquefied by heat, it may be removed by squeezing the sponge, or if not, it may be dried in place. Such a method of making sponge rubber would seem to offer the advantage of much better heat conductivity than the aerated type. This should be particularly advantageous in the case of thick sections.

Crude pectates form very cheap gels of low solids content that lose water by syneresis upon heating. Such gels have been found well suited to formation of rubber sponge, and the liquid exuded from the gel particles, being almost pure water, is easily expressed, leaving a sponge that is not loaded with soluble solids.

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Frictional Properties of Rubber

THE results of an extensive laboratory study of the coefficient of friction of rubber were reported by Frank L. Roth, Raymond L. Driscoll and William L. Holt of the National Bureau of Standards in the April, 1942, issue of the *Journal of Research*, published by the Bureau. Most previous investigations have dealt with specific rubber products, such as tires or belting, and the experimental conditions have been those under which the products are commonly used.

In the present investigation it was possible to employ a relatively wide range of experimental conditions and to control the compositions and surface conditions of the specimens and the tracks. The principal factors considered were speed of slide, roughness of sliding surfaces, pressure of one surface on the other, size of specimens, cleanliness of sliding surfaces, and composition of the rubber.

The following results were obtained:

1. When a clean rubber specimen is towed at a constant speed of 10^{-3} cm/sec or more along a smooth track, the friction increases, reaching a constant equilibrium value only after several centimeters, of slide; correspondingly, when the specimen is allowed to slide down an inclined track under a constant load, the speed decreases to its equilibrium value. When a specimen is towed at a speed appreciably less than 10^{-3} cm/sec, the friction decreases to its equilibrium value; correspondingly, a specimen will continue to slide down an incline even after the angle of incline is decreased to a value less than the angle of repose.

2. The equilibrium coefficient of friction increases markedly with speed—the values varying from about 1 at speeds of the order of 10-4 cm/sec to more than 4 at speeds of about 5 cm/sec. The occurrence of vibrations of the specimens prevented observations at speeds much over 5 cm/sec. The softer rubber compounds vibrated at even lower speeds.

3. The equilibrium coefficients of friction for very low sliding speeds are less than the coefficient of static friction, but at speeds of 10^{-3} cm/sec or greater the dynamic coefficients are greater.

4. Except for speeds appreciably below 10^{-3} cm/sec, the rougher the sliding surfaces the lower are the observed coefficients.

5. The coefficients of friction for a rubber compound are not greatly dependent on the compounding ingredients so long as these ingredients do not bloom out on the sliding surface. The presence of materials such as bloom or talc on the surfaces decreases the values of the observed coefficients.

Hi-Tear Micronex

RECENT research conducted by the Binney & Smith Co., 41 East 42nd St., New York City, revealed the fact that the nature of the surface of colloidal carbons may be so altered as to retain all the advantages of a given particle size while bringing about some measure of improvement in certain properties heretofore impaired. As a result of this research the company has developed and introduced Hi-Tear Micronex, a new member of the Micronex series.

Channel carbon blacks are acidic in nature ranging in pH from 3.8 to 5.0. Hi-Tear Micronex, however, has a pH of 7.0 with a particle size the same as Standard Micronex. This higher pH reduces cure retardation, according to the company, while the surface of the new carbon wets better thus improving dispersion. Considering Standard Micronex as 100%, Hi-Tear Micronex shows by comparison: Tensile Strength, 102%; Plasticity, 108%; Extrusion Index, 106%; Aging Properties, 101%; Tear, 110%; Flex Resistance, 110%.

The combination of properties in Hi-Tear Micronex is said to be of special interest to the electrical cable industry. The faster rate of cure has significance in the continuous vulcanization process. A quicker set up minimizes such undesirable effects as result from slight undercure. Better plasticity means a smoother, more uniform extruded covering. At the same time this covering will have enhanced wearing and tearing resistance. These advantages are also apparent to the footwear industry.

Naftolen as a Compounding Material for Synthetic Rubbers of the Buna N Type

By FRITZ ROSTLER and VILMA MEHNER

Wilmington Chemical Corp., Wilmington, Delaware

(Concluded from the April, 1942, Issue)

Incorporation of Sulfur

The observation was made that it is sometimes difficult to obtain a definite optimum in the tensile curve, even by using the optimum amount of sulfur and stearic acid. In plotting the tensile against time of cure, undulating curves develop in very many cases; with some batches of synthetics more, with others less. Although the mixing was done very carefully it was often impossible to duplicate results for tensile and elongation within the limits of error usual with natural rubber, even with test pieces cut from the same slab.*

Superficial observation of the uncured slabs, especially under a magnifying glass, showed a poor dispersion of sulfur. If the cured stock was stretched, spots which actually appeared to be spots of hard rubber could be observed. It was, therefore, assumed that a poor dispersion of sulfur was responsible for the irregularities in the test data for tensile. The ability of Naftolen to dissolve sulfur pointed to a possible method of eliminating the poor sulfur dispersion. It was expected that by using a solution of sulfur in Naftolen a uniform distribution of the sulfur could be achieved.

* In some cases these irregularities were so great as to completely mask the results of test series, which had to be discarded.

Three stabilized solutions were prepared containing respectively 6%, 10%, and 15% sulfur in Naftolen (Naftolen R100/S6, Naftolen R100/S10, and Naftolen R100/S15). A series of mixtures was set up comparing these three sulfur-Naftolen combinations with parallel mixtures in which sulfur and Naftolen were used separately, and with control mixtures without plasticizer and with dibutyl phthalate as a plasticizer. First 50 parts and then 25 parts of Naftolen and dibutyl phthalate on 100 parts of Hycar O.R. were compared. Table VII shows the composition and the physical data. Figures 6 and 7 illustrate the curves for tensile strength plotted against time of cure. Figure 6 shows the curves for the mixtures in which the sulfur was incorporated as such, and Figure 7 for the mixtures where it was incorporated as a Naftolen-sulfur solution.

Comparison of the curves in Figures 6 and 7 confirms the assumption that the incorporation of the sulfur in solution largely eliminates the irregularity in the tensile. Test pieces for single cures gave check results as with natural rubber. As to the three sulfur solutions (Naftolen R100/S6, Naftolen R100/S10, and Naftolen R100/S15) the physical data for Mixtures 4 through 9 recommend the use of Naftolen R100/S10. It can further be seen that more highly

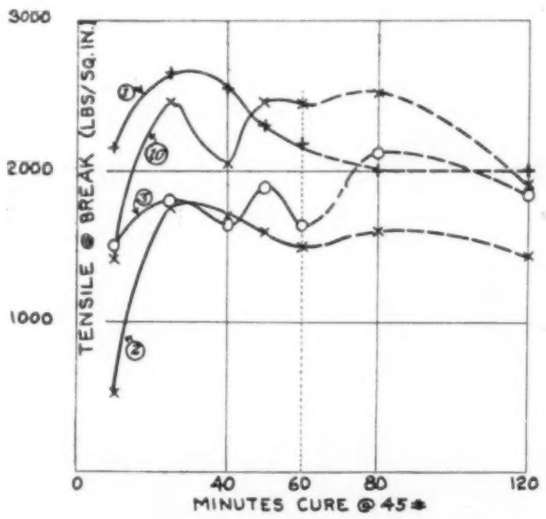

Figure 6—Series H/SSS

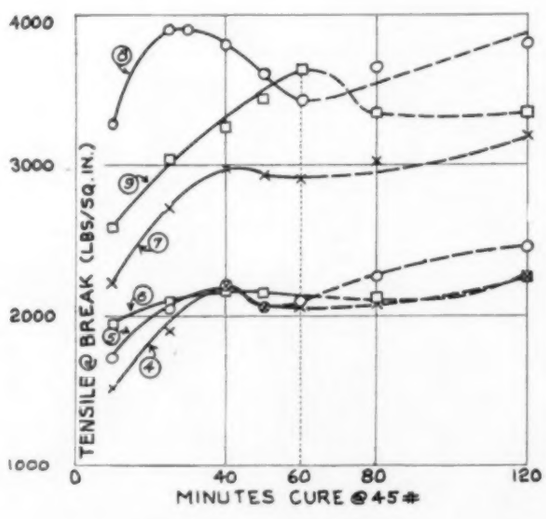

Figure 7—Series H/SSS

TABLE VII—SERIES H/SSS

Mixture No.	1	2	3	4	5	6	7	8	9	10
Hycar O.R.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
Stearic Acid	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Naftolen R-100	....	....	50.	....	....	....	....	....	....	....
Naftolen R100/S6	....	....	....	53.	....	....	26.5	....	....	....
Naftolen R100/S10	....	....	....	....	55.5	....	....	28.	....	....
Naftolen R100/S15	....	....	....	....	....	59.	....	....	29.5	....
Dibutyl Phthalate	....	50.	....	....	....	....	....	....	....	25.
Altax	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
D.P.G.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Micronex	55.	55.	55.	55.	55.	55.	55.	55.	55.	55.
Zinc Oxide	5.	5.	5.	5.	5.	5.	5.	5.	5.	5.
Sulfur	3.2	3.2	3.2	....	....	....	....	....	....	2.8
Optimum Cure @ 45# (min.)	25	25	80	40	40	40	120	30	60	25
Hardness (Shore)	85	56	63	71	75	80	76	74	79	69
Stress Strain @ 300% (lbs./sq. in.)	....	810	1250	850	1130	1440	1380	1430	1400	1350
Stress Strain @ 500% (lbs./sq. in.)	....	1710	....	1780	....	....	2720	2960	2890	....
Tensile @ Break (lbs./sq. in.)	2650	1760	2120	2200	2200	2170	3200	3900	3630	2470
Elongation @ Break (%)	250	510	423	563	490	410	580	580	570	470
Abrasion	*	110	*	*	*	*	*	*	*	*
Lupke Resiliometer Test:										
1st Impact	33	63	31	27	25	23	33	31	28	53
2nd Impact	11	40	10	7	7	5	11	10	8	29
3rd Impact	3	26	3	1	2	1	4	3.5	2.5	17
4th Impact	1	17	1	..	0.5	..	1.5	1	0.5	10
5th Impact	..	11	..	..	..	..	0.5	0.5	..	6
6th Impact	..	8	..	..	..	..	..	..	..	3
7th Impact	..	3	..	..	..	..	..	..	..	2
8th Impact	..	2	..	..	..	..	..	..	..	1
9th Impact	..	1	..	..	..	..	..	..	..	0.5

* Abrasion 0.0. It was impossible to take off even traces of the compound by one-half hour grinding time on the machine.

plasticized mixtures are less capable of dispersing the sulfur than harder mixtures. This is in accord with the observation that the best dispersion of dry sulfur was obtained when the sulfur was incorporated immediately after the synthetic rubber had been broken down.

A comparison of the physical data for the optimum cure of Mixtures 1, 2 and 3 shows that the findings in Table VI with Perbunan also hold for Hycar O.R.: 50 parts of Naftolen decrease the tensile strength of Buna N-carbon black mixtures much less than the same amount of dibutyl phthalate. The abrasion test also shows that the excellent abrasion resistance of Hycar O.R. is not influenced by Naftolen while 50 parts of dibutyl phthalate cause a distinct lowering. Mixtures 7 to 10, containing 25 parts of Naftolen, establish clearly the advantage of Naftolen in Hycar O.R.-channel black mixtures. Mixture 8 exhibits an appreciable superiority over the other mixtures compared including both controls (Mixture 1, plasticizer-free mixture, and Mixture 10, containing 25 parts of dibutyl phthalate). The figures for resilience, however, are in favor of dibutyl phthalate; resilience is lower with all other mixtures of this series.

Another observation of interest from a theoretical point of view is that all the mixtures shown in Table VII exhibit an increase in tensile together with a decided decrease in elongation with extremely long cures. This suggests that some kind of a second vulcanization reaction takes place with continued heating. However, in observing the part of the curves up to 60 minute cures, which would be the usual range of testing and of interest, it can be seen that the incorporation of sulfur dissolved in Naftolen brings about not only a desired plateau, but also physical properties better than those of the other mixtures investigated.

Table VIII Series H/SS shows four mixtures in which the amount of Naftolen R100/S10, the 10% sulfur-Naftolen combination, is gradually increased. In using a 10% sulfur solution in Naftolen, in amounts higher than 10 parts on 100 Hycar, the figures for hardness, tensile and elongation indicate that the amount of sulfur satisfies very well the demand

TABLE VIII—SERIES H/SS

Mixture No.	1	2	3	4
Hycar O.R.	100.	100.	100.	100.
Stearic Acid	0.5	0.5	0.5	0.5
Naftolen R100/S10	10.	20.	25.	30.
Altax	1.5	1.5	1.5	1.5
Micronex	55.	55.	55.	55.
Zinc Oxide	5.	5.	5.	5.
Agerite Powder	1.	1.	1.	1.
Optimum Cure @ 45# (min.)	180	180	180	180
Hardness (Shore)	75	71	70	69
Stress Strain @ 300% (lbs./sq. in.)	1380	1090	1040	960
Stress Strain @ 500% (lbs./sq. in.)	2840	2450	2390	2180
Tensile @ Break (lbs./sq. in.)	3810	3900	3720	3410
Elongation @ Break (%)	625	660	667	643

TABLE IX—SERIES Sy/N/n

Mixture No.	1	10	8	8a	8b	8c
Perbunan	100.	100.	100.	100.	100.	100.
Stearic Acid	0.5	0.5	0.5	0.5	0.5	0.5
Naftolen R100	....	....	....	25.	25.	25.
Naftolen R100/S10	....	....	28.	....	....	....
Dibutyl Phthalate	....	25.	....	....	....	....
Altax	1.5	1.5	1.5	1.5	1.5	1.5
D. P. G.	0.25	0.25	0.25	0.25	0.25	0.25
Channel Black	55.	55.	55.	55.	55.	55.
Zinc Oxide	5.	5.	5.	5.	5.	5.
Sulfur	2.8	2.8	....	2.8	3.5	5.
Optimum Cure @ 45# (Min.)	60	45	45	45	45	45
Hardness (Shore)	64	65	62	66	69	70
Stress Strain @ 300% (lbs./sq. in.)	...	2040	740	1580	2000	....
Stress Strain @ 500% (lbs./sq. in.)	...	....	1610	....	....	....
Tensile @ Break (lbs./sq. in.)	2240	2040	2310	2170	2140	2470
Elongation @ Break (%)	240	300	640	370	310	280

TABLE X—SERIES Sy/N

Mixture No.	1	2	3	4	5	6
Perbunan	100.	100.	100.	100.	100.	100.
Stearic Acid	0.5	0.5	0.5	0.5	0.5	0.5
Naftolen R100	50.	....	....	....	50.	....
Naftolen R100/S10	....	55.5	....	55.5	....	....
Dibutyl Phthalate	....	....	50.	....	....	50.
Altax	....	....	....	1.	1.	1.
D. P. G.	....	....	....	0.25	0.25	0.25
Channel Black	55.	55.	55.	55.	55.	55.
Zinc Oxide	5.	5.	5.	5.	5.	5.
Magnesium Oxide	5.	5.	5.	5.	5.	5.
Sulfur	5.	....	5.	....	1.5	1.5
Optimum Cure @ 45# (min.)	80	120	120	120	120	120
Hardness (Shore)	51	50	44	52	50	50
Stress Strain @ 300% (lbs./sq. in.)	770	310	310	510	420	690
Stress Strain @ 500% (lbs./sq. in.)	1850	860	640	1300	1090	1640
Tensile @ Break (lbs./sq. in.)	2970	2420	920	2760	2280	1760
Elongation @ Break (%)	650	860	650	740	790	520

of the combined hydrocarbons (Hycar plus Naftolen), independent of how much of the solution is used.

For the sake of completeness, a series with Perbunan was made to test the advantage of working with sulfur solutions in compounding Buna N. Table IX contains mixtures comparable to Mixtures 1, 8 and 10 in Table VII and, in addition, a new mixture—8a—in which Naftolen and sulfur were incorporated separately into the mix. The superiority of Naftolen to dibutyl phthalate is again shown, and the superiority of the sulfur solution to the separate addition of Naftolen and sulfur. Mixtures 8b and 8c were added to check again on the proper sulfur concentration since a new shipment of Perbunan was used.

Rate of Cure

Having this information on the use of Naftolen-sulfur solution, a series of slow-curing mixtures was set up with Perbunan to answer two questions: first, whether an organic accelerator is necessary, and second, whether the advantage of Naftolen over dibutyl phthalate still holds with lower sulfur ratio. In these mixtures (Table X) 50 parts of Naftolen and of dibutyl phthalate were used in order to make the results obvious. Mixtures 1, 2 and 3 were made with Naftolen R100, Naftolen R100/S10 and dibutyl phthalate with 5 parts of zinc oxide and 5 parts of magnesium oxide and no organic accelerator. From Mixture 3 it can be seen that with dibutyl phthalate an organic accelerator is more necessary to effect a cure than with Naftolen.

Comparison of Mixtures 1 and 2 shows with the sulfur solution a somewhat slower cure, lower hardness, lower tensile strength and higher elongation. All these differences point to the possibility that the sulfur, which is known to be partially in chemical combination with the Naftolen in the stabilized solution used, is

TABLE XI—SERIES Sy/Ch

Mixture No.	a	b	1	2	3	4	5	6
Chemigum	100.	100.	100.	100.	100.	100.	100.	100.
Stearic Acid	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Naftolen R-100	....	....	....	25.	....	....	25.	25.
Naftolen R100/S10	55.5	55.5	....	....	28.	....	....	....
Dibutyl Phthalate	....	....	....	....	....	25.	....	....
Altax	....	1.	1.5	1.5	1.5	1.5	1.5	1.5
D.P.G.	....	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Micronex	55.	55.	55.	55.	55.	55.	55.	55.
Zinc Oxide	5.	5.	5.	5.	5.	5.	5.	5.
Magnesium Oxide	5.	5.	....	....	....	....	....	....
Sulfur	....	....	2.8	2.8	....	2.8	3.5	5.
Optimum Cure @ 45# (min.)	120	120	25	35	120	25	25	25
Hardness (Shore)	53	56	84	70	62	69	70	75
Stress Strain @ 300% (lbs./sq. in.)	390	420	....	1870	930	....	1830	2580
Stress Strain @ 500% (lbs./sq. in.)	820	1090	....	....	2180	....	....	....
Tensile @ Break (lbs./sq. in.)	2190	2650	2370	3060	3140	1860	2810	2660
Elongation @ Break (%)	827	760	173	430	650	265	410	310

less available for vulcanization of the synthetic rubber than when the sulfur is added separately.

Comparison of Mixtures 2 and 4 in Table X indicates that it is advantageous, but not absolutely necessary, to use an organic accelerator to effect a cure in Perbunan-Naftolen mixtures. The need for an accelerator in Naftolen-free mixtures is obviously greater.

Mixtures 5 and 6 in Table X establish the superiority of Naftolen over dibutyl phthalate in the proportion of 50 parts to 100 parts of Perbunan even in a compound where the sulfur is adjusted to the requirement of the dibutyl phthalate compound, in which the sulfur demand is only that of the synthetic rubber. Both tensile and elongation of the Naftolen-containing compound are better than of the compound containing dibutyl phthalate, although the tensile is, of course, lower than in compounds with higher sulfur content.

Table XI shows a series of eight mixtures containing Chemigum as the Buna N type synthetic. The table and physical data are self-explanatory. It can be seen that the general rules of compounding Buna N type synthetics with Naftolen are to be applied to Chemigum as well as Perbunan and Hycar O.R. However, the figures suggest that somewhat more sulfur might be necessary than with the other Buna N rubbers compared in this study.

Pure Gum Stock

In order to have an indication of the influence of Naftolen on the Buna N hydrocarbons without the presence of reinforcing carbon black, three mixtures were made with Hycar without filler. Although these mixtures probably have little practical value they are reported because the results seem interesting. It is known that pure gum stocks of Buna N type synthetics have a very low tensile strength.

It has been stated in the literature that tensile strength of Buna N compounds must be brought about by channel black and that plasticizers as a rule reduce the tensile strength. Table XII shows the effect of Naftolen on pure gum stocks of this type.

Mixtures 1 and 2 are identical except for the Naftolen. Mixture 3 is another control with sulfur content adjusted for a Naftolen-free mixture. More work has to be carried out if a practical compound is to be developed, but it can be seen from the comparison of mixtures in Table XII that Naftolen increases tensile strength and elongation of Buna N in a pure gum stock.

It is shown that increased tensile and elongation are brought about by Naftolen not only in carbon black stocks but also in a pure gum stock. From these findings the conclusion can be drawn that Naftolen is a reinforcing plasticizer for Buna N.

TABLE XII—SERIES H/PG

Mixture No.	1	2	3
Hycar O. R.	100.	100.	100.
Stearic Acid	0.5	0.5	0.5
Zinc Oxide	5.	5.	5.
Altax	1.25	1.25	1.25
D. P. G.	0.25	0.25	0.25
Sulfur	2.5	....	1.
Naftolen R100/S10	....	25.	....
Optimum Cure @ 45# (min.)	25	40	25
Hardness (Shore)	55	43	52
Tensile @ Break (lbs./sq. in.)	960	1540	770
Elongation @ Break (%)	390	920	510

Summary

A basic formula containing channel black was set up to study compounding of domestic Buna N type synthetics with Naftolen. Perbunan, Hycar O. R. and Chemigum were used as Buna N type synthetics.

It was found that 0.5 parts on 100 parts of Buna N is the best concentration of stearic acid. The sulfur ratio should be approximately 2 to 2.5% of the total hydrocarbons (Buna N plus Naftolen).

It was shown that the irregularities in the physical data of Buna N compounds can be eliminated by incorporating the sulfur into such compounds as a solution in Naftolen. Mixtures were tested in which 25 and 50 parts of Naftolen, pine tar, and dibutyl phthalate were compared with 6%, 10% and 15% sulfur solutions in Naftolen. The 10% sulfur solution was found to be the most practical. Naftolen up to 50 parts does not impair the physical properties of a Buna N compound.

It was shown that 25 parts of Naftolen or, better, 28 parts of the 10% sulfur solution in Naftolen, on 100 parts of Buna N improves the physical properties of such compounds. The physical data of the investigated compounds allowed the conclusion that Naftolen can be called a reinforcing plasticizer for Buna N type synthetics.

The comparison of the physical data obtained for the basic formula with Perbunan, Chemigum and Hycar O.R. shows that these general rules of compounding apply to all three Buna N type synthetics tested.

ACKNOWLEDGEMENTS

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BUY WAR BONDS AND STAMPS

Nickel Alloy Permits Quick Repair of Bearings on Rubber Machinery

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DUE to the nature and severity of the service on rubber processing machinery, particularly milling machinery, its bearing maintenance has always been a source of concern to rubber mill engineers. Rubber mill operating conditions confront the bearing medium with every obstacle of pressure; the need for holding close working tolerances; internally and externally generated heat; the desirability of more speed, and the possibility of grit and foreign material entering the bearing. Also, the more recent use of rubber milling equipment on plastics and synthetic rubber mixes has increased the intensity of these wear factors, particularly those of heat and pressure.

Bronze as a Bearing Medium

The almost universal adoption of bronze or "brasses" as the best bearing medium for this service was established fairly early in the history of rubber manufacturing. Bronze has held its position largely because of its seemingly high efficiency and comparatively low cost, especially when compared with babbitt, composition inserts and anti-friction bearings. Actually, however, regardless of its composition or the method used in casting it, bronze, as a bearing material, has certain basic physical and metallurgical drawbacks, which preclude its ever becoming the ideal bearing for this type of service. These disadvantages are:

1. The bronze bearing, whether a stave or full circle liner, must be cast to a pattern and press-fitted to the bearing box. The expense of extra labor and material in the pattern and the cost in time and labor of the additional operations make the need of eliminating this procedure evident.

2. A bronze mixture having a sufficiently high Brinnell to withstand peak pressure loads will eventually score the neck of the roll. More seriously, in the event of faulty lubrication, it will seize the roll neck as well.

3. On the other hand, a bronze mixture with a Brinnell sufficiently low to protect the roll neck, will extrude under high peak loads.

4. Because of the comparatively high thermal acceptance of bronze the expansion caused by frictional heat, coupled with the fact that the liner is press-fitted, sets up structural strains in the material, which often lead to premature wear or early bearing failure.

5. A bronze liner once used must be discarded and sold for scrap; it has no reclaim value for the same use.

Obviously, the successor to bronze as a bearing medium for rubber milling equipment would have to overcome all of these basic faults and, at the same time, have pressure, wear resistance and other physical properties equal to this heavy duty application. It would also have to be as economical in first cost.

By direct collaboration with a large processor of reclaimed rubber in the East and by a new approach to non-ferrous metallurgy, the Jackson-Wheeler Metals Service, Inc., has developed and perfected an inexpensive white metal alloy which has been more than successful in setting new standards for rubber mill bearing performance throughout the industry. This material has been designated as Tuftin No. 73 Nickel Alloy.*

Metallurgy

We have found that the inclusion of nickel, cadmium, or both, even in small quantities, in various non-ferrous eutectics can bring about vastly increased physical and chemical properties in the completed alloy. Basically, nickel contributes "toughness" and heat resistance; cadmium, hardness without abrasion, and resistance to chemical action.

The term "toughness" seems more accurately de-

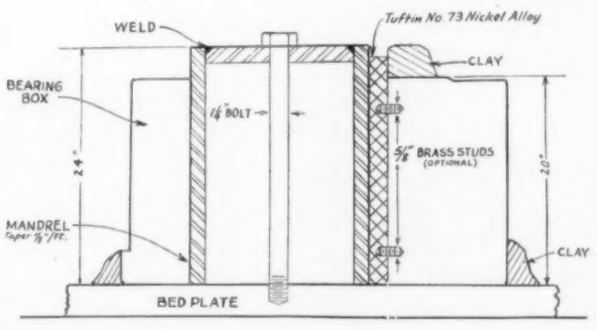


FIG. 1—Jig for pouring mill roll neck bearings.

* Alloy registered U. S. Patent Office.

scriptive of the effect of nickel inclusion in the alloy than the technical term "ductility" more frequently used. "Toughness" or "ductility" is that bearing quality which enables the material to withstand mechanical shock or pounding without fracture or extrusion. Heat resistance describes that bearing property which enables the material to maintain to a greater extent its original Brinnell hardness in the face of elevated running temperatures. An ordinary high grade tin-base babbitt, for instance, loses approximately 50% of its surface hardness when heated from 20° C. to 100° C.** Tuftin No. 73 Nickel Alloy gives the user a tremendous advantage in this respect. In addition, when the bearing is poured, the nickel in the alloy appears to penetrate the surface structure of the bearing box and secures a bond which is more like a well than a chemical bond of the type secured with ordinary babbitt.

Cadmium, properly mounted in the matrix by correct amalgamation, gives the metal a sufficiently high Brinnell to withstand the loads imposed over extended operating periods without wear or injury to the roll neck. It has been shown in the field that Tuftin No. 73 Nickel Alloy will not mar the roll neck in any way, even when the mill was run without lubrication until the rolls themselves became hot enough to assume a bluish cast. Cadmium, a metal which is relatively impervious to chemical attack by acids or alkalis, enables the alloy to be used under all conditions of operation with any standard oil or grease with equally fine results. Confirmation of this special property, too, has come from close observation in the field.

It can be readily appreciated, that to reveal the exact processes by which this alloy is synthesized would take up space better spent in dealing with the practical application of the metal itself and might also serve to nullify existing expedients to protect this information. Suffice it to say, our crucible method of alloying is the result of years of experience in this one field.

Handling

Tuftin No. 73 Nickel Alloy is handled and poured exactly like a high grade babbitt metal. No special equipment is necessary and the work can be done in the machine shop of the mill with the regular machine shop crew.

It pours at 850° F., or sufficiently hot to "char" a white pine stick. This is an old, recommended and reliable test which can be used with complete confidence where no pyrometer or other expensive equipment is at hand. The other simple, well-known steps used in poured bearing practice are followed in using this special alloy:

1. The bearing box and mandrel should be clean and freed from dirt, grease and other foreign matter.

2. The bearing box and mandrel should be preheated to about 250° or 300° F. This secures a perfect bond of alloy to bearing box and the shrinkage of the box upon cooling insures a perfect end fit in the case of stave lined bearings.

3. The pot and ladle must be thoroughly clean to offset the possibility of contamination by other metals previously melted and poured.

The simple jig shown in Fig. 1 is being used in the field with excellent results, although it is not the only method that has proved cheap and efficient. It has certain advantages, however, and can be made almost entirely from used material found in the shop. Besides being cheap, it is very flexible; it can be completely dismantled in a few seconds after use for cleaning and storing; the holding bolt and base can be used with mandrels of various sizes to accommodate the different types and sizes of mill bearings. Also, it is durable and will serve indefinitely and can be used for both stave and full circle lined bearings. Incidentally, the base need not be metal—it can be made from two layers of two-by-fours fastened counter-grained to form a platform which won't warp or break.

The sketch indicates a taper on the mandrel of ⅛-inch per foot. This is to facilitate withdrawal of the mandrel when the pour has cooled since the shrinkage factor of the alloy is negligible. This low shrinkage, of course, maintains the effect of the weld-like bond between the alloy and the bearing box when it was poured and also helps to achieve a perfect end-fit in stave lined boxes.

As to anchoring, the box need not be tinned since the alloy has excellent inherent bonding properties as previously explained. However, if it is the general practice of the factory to tin bearing jobs of this size, the practice can be continued with this alloy and equally fine results obtained. Fig. 1 also shows the use of soft brass studs, spaced regularly on the periphery of the bearing along each outer edge. This device has been used successfully on extremely large castings such as primary cracker roll bearings 19 inches in diameter. It is not necessary on regular work and may be used at the discretion of the engineer or master mechanic in charge of the mill.

The poured bearing may be machined to size to very high accuracy as the alloy is easily worked. In emergencies, it can be poured in place and run without machining with no risk of harming the roll neck.

Lubrication

As has been stated, Tuftin No. 73 Nickel Alloy may be used with either grease or oil. The lubrication may be cup-fed, wick-fed, drip-fed or force-fed. As a rule if the lubricant and method of application in general use in the mill is giving satisfactory results it may be continued with Tuftin. No change is necessary.

Dry-running tests in the laboratory indicate that this alloy has a coefficient of friction considerably lower than that of bronze. However, this test does not give the whole picture. For instance, bronze has a relatively high thermal inductance ratio. Frictional heat generated in the bearing is conducted through the bronze to the bearing box. Cast iron has a much lower thermal inductance capacity than bronze and so must repel some of this heat. The temperature of the bronze is thus elevated abnormally. Since the bronze casting is press-fitted, it is already under structural strain. Expansion caused by the increased temperature aggravates the extent of these stresses and causes excessive wear and often bearing failure, to say nothing of damage done to the roll neck itself.

This situation cannot occur with Tuftin since its thermal inductance ratio more nearly approaches that of cast iron and, consequently, there is no elevation of temperature due to heat storage in the alloy. Then, too, its physical structure, established metallurgically, sets up a definite capillary action on the bearing surface

** Figures published by the American Society for Testing Materials, Phila., Pa., tin base babbitt, grades 1, 2, 3 and 4.

which "hangs on" to the lubrication film and resists the wiping action of the roll neck. Thus, the neck is running more constantly on a film of lubrication and less frictional heat actually is developed. These particular properties have enabled mill speeds to be increased as much as 50%. The gain in increased production is evident.

In an attempt to parallel this performance, a full circle liner of bronze was tried, with the ends of the bearing sealed and the lubricant force-fed through the top of the bearing box. This proved a more expensive and less efficient installation than a standard one with Tuftin.

As far as oil grooves are concerned, more recent practice favors leaving the load-bearing area unbroken by criss-crossing oil grooves. A simple and extremely effective method of lubricant conveyance is as follows: a relief is bored on the off-side of the bearing, starting at the point where the lubricant enters and ending in a feather edge at a point just before the pressure area begins, as shown in Fig. 2. Since the lubricant has a tendency to splay out of the ends of the bearing when the pressure is applied, concentric oil grooves starting from the pressure edge of the bored reservoir and carried around the bearing about 1¼ inches in from each side and ending at the point on the off-side where the lubricant enters, will resist this tendency and carry any excess back into the reservoir.

This procedure is merely suggested because of its simplicity and proved effectiveness. There are hundreds of Tuftin installations in service using the older, criss-cross oil groove method. This, too, is a practice which can be decided upon by the individual mill engineer.

Bearing clearances in rubber mill work are important. Practical field experience shows conclusively that this large, heavy-duty work requires clearances equal to 0.00175 (one and three-quarter thousandths) to 0.002 (two thousandths) of an inch for each diameter inch of the roll neck. It must be remembered that these tolerances are established when both the bearing and roll are cold. In operation the roll neck becomes warm and expands, taking up a lot of this clearance. Therefore, it must be allowed in making the bearing, and this procedure has produced the best results.

Uses

Although Tuftin No. 73 Nickel Alloy was originally designed to overcome the difficulties met in refiner and other mill bearing operation, its unusual physical properties and ease and flexibility of handling have made it readily adaptable to other heavy duty applications. It is now being used on the newer high speed refiners, plastic and synthetic processing mills, Hog mills, high speed, heavy duty motors, reduction gear drive units, main drive lines and Banbury mixers, to mention a few.

The expensive bronze bushings in Banbury mixers can be reclaimed and re-used repeatedly by lining them with Tuftin if the casting is sound. These bearings tend to wear in an oval shape and must be machined true. The inside is then "roughed", may be tinned if desired, and the alloy is poured into the warmed casting around a length of ordinary pipe wrapped in waxed paper. The bearing is poured under size and machined to finished dimensions. A bearing thus rehabilitated will give even longer service than when new and, as

FIG. 2—Primary cracker roll neck bearing, 19-inch diameter, lined with Tuftin No. 73 Nickel Alloy, showing bored relief for lubrication.

long as the casting remains sound, the process may be repeated indefinitely simply by melting the worn metal out and re-pouring and finishing.

Worn full circle lined mill bearings which have been securely anchored by a pinned flange to the bearing box can also be reclaimed by using Tuftin No. 73 Nickel Alloy. These bearings are merely converted to stave lined boxes by cutting out the worn segment on the pressure side. Tuftin is then poured into the open segment in the usual way and finished to size.

In addition to economies accruing to the user from longer bearing life, lower maintenance cost, re-useability, and increased production from higher operating speed, this alloy actually has a lower specific gravity than bronze. It weighs only 4.31 ozs. per cubic inch, or about ⅓ less than bronze. Consequently, less of it is needed to fill a given area. Also, all pot pieces, chips, filings and turnings are useable and when bearing replacement is necessary the alloy in the bearing may be used again entirely. It is very stable and can be re-melted indefinitely without impairing its properties.

Summary

The need for an inexpensive, durable and flexible material for bearing service on rubber milling machinery has been a critical one for many years. This company, fortunate in securing the cooperation of a large and progressive rubber reclaimer, recognized that need and made a concerted effort to meet it. This was some eleven years ago. The result, Tuftin No. 73 Nickel Alloy, now has an eight-year record of excellent performance in representative rubber factories in the United States behind it. Its use is gradually spreading too, particularly in Canada and South America.

The alloy perfected has high and unusual physical properties, is long wearing, non-abrasive, heat-resistant, stable, inexpensive, and can be handled in the factory by the mill maintenance personnel and existing equipment. Its extraordinary properties are obtained by the use of virgin nickel and cadmium, alloyed into a non-ferrous matrix by a special crucible process employing rigid thermal and atmospheric control. Virgin metals are used throughout and each charge is spot sampled and laboratory checked before shipment.

Mechanical Developments in the Field of Rubber During 1941

Report of the Sub-Division on Rubber & Plastics of the American Society of Mechanical Engineers

By FELIX L. YERZLEY*

THIS is the second annual report *(1)* to the Rubber and Plastics Subdivision (of the American Society of Mechanical Engineers) on progress during a calendar year in the mechanical technology of rubber. In a very real sense it is a resume of many contributions made by mechanical engineers and the technologists of the rubber industry to the security of freedom. No sincere issue can be taken with the view that our major effort now must be for victory, but the longer view, which also cannot be forgotten, is that developments under the stress of these times will carry over into peacetime benefits.

When the year 1941 was young, the anti-Axis powers faced incredibly efficient mechanized forces with commendable courage and appalling deficiencies of material and manufacturing capacity. As the year closes, the balance is swiftly changing. This country is on the verge of unparalleled production of the implements of war. Entwined in this great program and essential to it is the increasing influence of rubber. New concepts of production, design, weight, assembly and style are developing, and engineers who keep abreast of the tide can best anticipate future technical needs and price competition.

Although, for commercial reasons, the products of today must in general wait for open technical description until tomorrow, every application indicates a trend, and every trend is based upon substantial technical progress illustrated by the applications. Hence the available literature has significance beyond the details it contains, and suppliers and designers alike can well afford to study it and cannot afford not to if they intend to keep abreast of the swift moving tide of modern design.

For lack of any more generally acceptable terminology the word rubber is used in this report in its broadest sense, and distinction is made between natural and synthetic rubber only when it is particularly important to do so. To a designer, the source is immaterial, the performance paramount, and all generalizations must be qualified without exception by the assumption that each competent designer will know the characteristics required for the performance of a given part and that he will label his requirements by full specifications to prevent installation of inadequate materials. At the same time, the designer must know that when two parts can be made satisfactorily of the same composition, there is much to be gained in uniformity and economy by using the same material specification for both.

The diversity of products required by the armed forces is suggested by the following partial list of products being made by one of the large rubber companies:

- Tank track blocks and bushings
- Half tracks
- Hatch gaskets
- Motor mountings
- Bogie tires
- Self-sealing tubes
- Self-sealing gas tanks
- Self-sealing fuel and oil hose
- Latex sponge parachute pads
- Latex wing fillers
- Latex pilot seat pads
- Rubber cement
- Various gas mask parts consisting of
  - (a) Flat faceblanks
  - (b) Fully molded faceblanks
  - (c) Outlet valves
  - (d) Deflectors
  - (e) Hose tubes
  - (f) Various gaskets
- Friction tape
- Rubber tape
- Radiator hose
- Barrage balloons

Further expansion of this theme is found in the literature *(2, 3)*. There is little technical information in published literature specifically related to military items. There are extremely important developments under way, however, on motor supports, particularly for aircraft power plants. We are indebted to a private source for the following information.

Perhaps of primary importance in the aircraft engine mounting field has been the standardization and adoption of Dynafocal Suspension for the mounting of large radial engines. Dynafocal Suspension is the trade name applied to a directional spring mounting system so arranged as to obtain a virtual center of gravity suspension, even though the mountings are necessarily attached to the rear of the engine. By its use isolation for all types of vibratory disturbances arising from the engine-propeller combination can

Note: This report was presented at a meeting of the sub-division held in New York City on December 4, 1941.

* Formerly associated with the Rubber Chemicals Division of E. I. du Pont de Nemours & Co.; now with the Pioneer Instrument Division, Bendix Aviation Corp., Bendix, N. J.

be achieved without the introduction of an undue amount of instability such as usually would occur with an overhung suspension made adequately soft to give the desired isolation.

In these suspensions the use of shear stressed rubber as the flexing medium has been employed as being the most efficient and easily applied method of achieving the flexibility. Designs are of two types, the link type and the flexible pedestal, or inclined sandwich, type. In the link type, Dynafocal Suspension, bonded rubber tube form mountings are arranged tangentially to a circle, the center of which is the crankshaft center line, and connection is made to the structure by means of links which are inclined toward a focal point slightly ahead of the center of gravity.

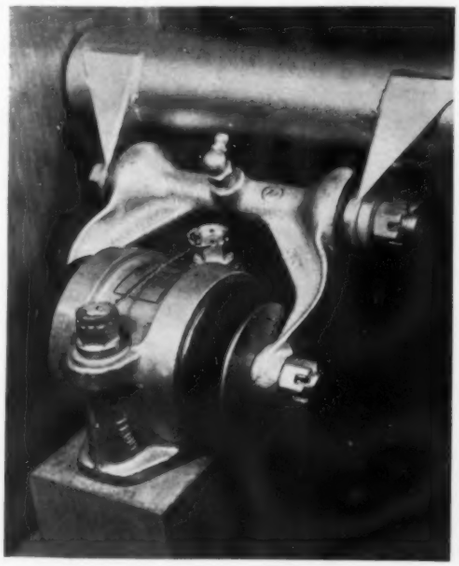
In the pedestal type, bonded rubber sandwich-type mountings are used, with the sandwiches inclined so that focal lines drawn normal to the plane of the sandwich would again meet at a point slightly in advance of the center of gravity of the supported assembly.

The use of rubber mountings in aircraft for shock and vibration control has become standard procedure. The most common applications are on instrument panels, radio, individual instruments, and cowls. Both radial and in-line engines are usually mounted on rubber mountings.

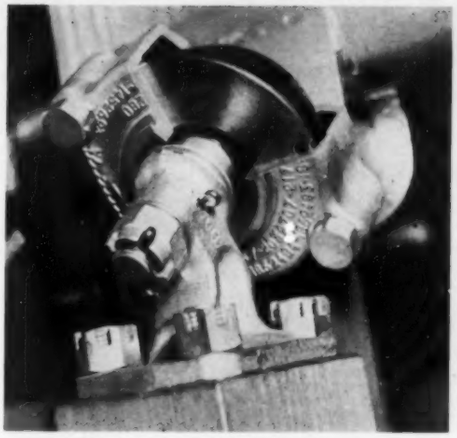
Extensive additions have been made to the variety of commercial mountings, and it is fair to assume that the number will continue to increase. The following data on mountings for compressive loads appeared recently *(4)*:

Mounting Load Pounds	*Minimum Disturbing Frequency Cycles per minute*
A 250	850
B 150	1200
C 85-100	1250

The impelling motive behind most applications of rubber springs for mounting purposes in all classes of machinery is the reduction of vibration. An important analysis of vibration in automobiles *(5)* was presented. Intensive work is being conducted in laboratories throughout the country on mounts for all types of internal combustion engines in marine, railway, automotive, and aviation equipment. Further refinements and novel improvements can be expected.



Link type of Lord Dynafocal Suspension (System RL-25) intended for Wright Double Row Cyclone Engine.



Pedestal or inclined sandwich type of Lord Dynafocal Suspension (System MR-25-A) for P & W Twin Wasp Engine. This is a cutaway view.

The automotive industry has continued to lead in the application of rubber. Wide rim pneumatic tires have been introduced *(6)* for which greater riding comfort and road stability are claimed. A variety of rubber and synthetic rubber parts have been added to automobiles and have been described in excellent papers *(7, 8, 9)*.

During the year semi-conducting rubber has come into large-scale commercial production. It is made by the inclusion of specific types of carbon black in the compound. Application is found in quantity where static electricity must be dissipated. Industrially the explosives, petroleum, and transportation industries afford the biggest markets for belting, footwear, and tires. Static elimination in the operation of automobiles prevents the danger of shock and improves radio performance *(10, 11, 12)*. Semi-conducting rubber is also applicable for heating purposes and is used in this manner in flying suits for use at high altitudes.

Compression and stress decay in rubber gaskets often are serious questions in design. An analysis of experimental results led to the following recommendations for longest useful life *(13)*:

1. Roughened flanges and absence of lubricating paste.
2. High initial load short of the crushing strength of the material.
3. Thin gaskets.

Vibration isolation has continued to pose the question regarding the possibility of making rational analysis related to practical application of the damping (hysteresis) properties of rubber. Reports expressed from several sources indicate that ideal spring systems can be obtained by the proper combination of metallic and rubber spring components. Large harmonic balancers of the torsional type are being installed in production on the crankshafts of marine diesel engines.

Further tests have been reported bringing out additional information on the mechanical characteristics of rubber. One interesting paper deals with a variety of spring shapes and the relative importance of shear, tension, and compression in the overall spring rate *(14)*. Static fatigue life was studied comprehensively by other investigators, and important information on permissible stresses and strains is indicated *(15)*. An especially valuable paper *(16)* on the creep of natural and synthetic rubbers over periods as great as 900 days was presented before the subdivision, probably to become the cornerstone of extensive literature on this subject. A paper on the creep of neoprene provides supplementary information *(17)*. Several synthetic rubbers are compared in various ways in a timely paper presented to automotive engineers *(18)*.

While product engineers have been given the spotlight, process engineers have been active on important factory problems. One engineer visualizes rapid transition of the rubber industry from batch processing to continuous processing *(19)*. Another engineer called attention to the ever important problem of safety on mills and calenders *(20)*. Progress in the theory of elasticity was also reported *(21)*.

Maintenance of raw material supply was especially interesting in connection with synthetic rubber. The question was dealt with in lucid and important papers *(22, 23)*. Production estimates for all types are well over 22 million pounds for the year with predictions for 1942 far in excess of this amount. This estimate includes both oil-resistant and other types.

The synthetic rubber picture is made more interesting by the continuance and acceleration of research. During the year gradual development of all types has made them more useful and more readily processed. In addition, major contributions to rubber technology have been marked by two entirely new types of neoprene, one of which can be plasticized to putty-like consistency before vulcanization, the other an oil-resistant material having freeze resistance comparable with that of rubber.

It is impossible to predict the nature of things to come, but it is definite that the assimilation of new knowledge and materials will be reflected in 1942.

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Kemifilm Transparent Coating

A NEW coating material, called Kemifilm Transparent Coating, has been developed and introduced by the Wayne Chemical Products Co., 8900 Copeland St., Detroit, Michigan. It is made from cellulose and synthetic resins, plus a small amount of plasticizer, the balance of the composition being acetate solvents.

Although Kemifilm is being used principally on metal objects, due largely to the shortage of chemicals and metallic coatings formerly used to protect the surfaces and finishes of metal parts, including machines and objects of some size, it also finds application in connection with hard rubber products. It is quite transparent and is resistant to moisture and abrasion. Salt spray box tests indicated that steel panels having a single coat of Kemifilm resisted rust for more than 90 hours.

According to the manufacturers, the new coating material offers large coverage, an extremely thin film, and dries for handling in 3 to 5 minutes. In addition to its use for metals and rubber it is also suitable for use with leather, ceramics, plastics and many other articles.

Processed Liners

—Their Use and Advantages in a War Economy

By E. C. POPE
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*Cleveland Liner & Mfg. Co.,**
Cleveland, Ohio.

Today's needs for conserving and extending all available crude rubber stocks are making it necessary to get greater efficiency and economy in all rubber manufacturing operations. Processed or treated non-sticking liners, long used in the rubber industry for many purposes, are also valuable aids in rubber conservation. Many younger technologists who have entered the industry since the advent of processed liners a score of years ago may not fully appreciate the reasons for their use or their advantages and the important part they play in rubber manufacturing operations. With these thoughts in mind, we asked the oldest producer of such liners to review briefly the history of liners, their use and the many advantages they offer over plain untreated fabric in preventing adhesion of rubber stocks.
—Editor.

IN CONSIDERING the subject of processed or treated liners it is well to go back some twenty years to the time when a liner was considered a necessary evil in handling uncured stocks. A separatory material was essential in successfully handling tacky stocks, and tacky stocks were essential for complete cohesion. It was only natural then that cotton duck fabric, because of its strength and flexibility, was used to perform this very important function.

The use of plain fabric as a liner was the answer to the problem in part only, as the difficulties encountered presented so many disagreeable characteristics that the user was little better off than before. If the stocks were compounded so that they were tacky enough to give the required cohesion, then it was next to impossible to separate the stock and liner without destroying the gauge or leaving rubber spots on the liner. Such spots made it necessary to take the liner out of production for cleaning—an expensive operation, as well as having on hand a greater inventory of liners than was actually needed so that those out of production could be replaced. Lint and ravelings presented their problems as no one wished to contaminate his stocks with foreign matter of this nature. If dry stocks were used to overcome the difficulties mentioned above, then one was faced with poor cohesion and ply separation. All in all an unfavorable condition existed for controlled production.

To meet the need for a liner which would overcome the many disadvantages of plain untreated fabric, a processed liner was developed to facilitate the handling of rubber stocks and to reduce labor and power costs. This liner has been in satisfactory use for almost twenty years by a majority of rubber companies both here and abroad. The treatment produces a long wearing glazed surface which is tough yet flexible, and film-forming. Liners treated by this process have been known to be used repeatedly for periods up to ten years or more with little loss in effectiveness. In addition, processed liners are beneficial to rubber stocks, easy to handle, effect definite cost savings and are adaptable to most grades of stocks and places where a liner is required.

In order that the advantages of processed or treated non-sticking liners may be better understood, they will be discussed briefly under the several headings just enumerated.

Benefit to Rubber Stocks

Processed liners have proved beneficial to rubber stocks for the following reasons:

1. The treatment is of such a nature that the freshness and tackiness of the stock are preserved. There is no migration of ingredients that would tend to destroy the tack of the stock.
2. Gauges of stock are maintained. This cuts down on loss of material, requires less time by the workmen in construction, and reduces rejections by the inspector.
3. Horizontal storage of stocks is effected. Vertical storage is detrimental to both stock and liner as it causes edges to curl with a resultant loss of material because of the tendency to thicken.
4. Lint and ravelings are fixed so that they do not adhere to the tacky stock. This eliminates the necessity for removing them from the surface of the stock as well as preventing poor cohesion between plies. The elimination of lint is a bigger problem today than ever, owing to rigid specifications on government work.
5. Stocks are protected from air, moisture, and sunlight. This prevents oxidation and mould, and preserves the freshness and tackiness of the stock.
6. Latitude in compounding is increased. This permits the use of softer and tackier compounds—a decided advantage at times and one which a plain fabric liner prevents because of cost owing to compound loss.

Ease of Handling

Processed liners are easy to handle and facilitate the handling of stocks for the following reasons:

* Producers of "Climco" Processed Liners.

1. Flexibility of liners is of vital importance, and this quality remains throughout the life of the fabric. A liner which stiffens with age would present many problems as detrimental as a plain liner.

2. Separation of stock and liner is made with comparatively little effort. At the same time it is not so easy as to allow the stock to slip when in the liner. This is a finely balanced point and one of extreme importance.

3. Stocks, with the exception of scorchy compounds, can be allowed to stay in the liner several days if necessary, without harmful effect. This is an advantage in aging and controlling a smooth flow to the production line.

4. Treatment sets the threads of the fabric so that if the liner does tear or is cut into narrow widths no trouble will be experienced with the edges fraying or raveling.

5. Treatment makes it easy to clean the liner quickly and easily by wiping with an inexpensive solvent, such as gasoline. Any liner with usual handling is apt to be subjected to oil and grease.

Definite Cost Savings

Despite a higher initial cost, processed liners result in a saving in the final cost of rubber products for the following reasons:

1. The life of fabric treated for liner use is considerably longer than untreated fabric. This is accomplished by easier separation of stock and liner which cuts down tearing and ripping and eliminates the waste occurring when a torn liner must be repaired. Proper treatment also increases the tensile strength of the fabric thereby cutting down the tendency to tear. Fabric with a proper treatment does not make a satisfactory wiping rag, consequently pieces are not torn from the liner for this use. A treated fabric does not have the many household uses that a plain fabric has, so little or no loss occurs from fabric being carried away. This may sound like an odd reason for the use of a processed liner but surveys show that the loss of fabric from being carried out of the plant is a major factor of cost in many plants. The psychological effect on the workers is an item to be considered also, as a treated liner is looked upon with more respect than is "just a piece of cloth." Today when fabrics are difficult to obtain and high in cost, increased life of the fabric is absolutely essential. Conservation in the war program is a point which must not be overlooked.

2. Brushing and cleaning is eliminated. The labor and power saved here is a tremendous factor. Labor formerly used for this operation can be utilized in production. The need for brushing and cleaning is done away with as the liner remains clean and free from rubber spots. Talc need not be used, hence no cleaning and brushing is necessary. Liner turnover is more rapid, making it possible to operate on reduced inventory of liner fabric.

3. Where talc is not used, a saving is made on material cost as well as the elimination of unhealthy dust-filled atmosphere. It is, of course, well known that healthy working conditions improve production.

4. Easy separation of stock and liner requires less energy from labor and less power consumed. Labor-energy saved means greater output from labor; power consumption saved means reduced cost.

5. Horizontal storage is possible with no loss owing to curled edges or thickening of stock.

6. Rerolling, in order to cool and prevent sticking, is eliminated, resulting in labor and power savings.

7. Trucking and handling is materially reduced, resulting in reduced labor cost.

8. Rerolling before returning to the calender is eliminated. This of course depends upon the care taken in winding the liner at the cutting table or bias cutter. One complete handling is eliminated with labor and power saved.

A well made processed liner is universal in its use and successfully handles coated and frictioned stocks and most grades of gum stocks. It is equally adaptable to batch stocks and book leaves for all types of stocks. Even the newer synthetic rubbers and rubber substitutes have been handled satisfactorily. With the exception of one or two compounds, no trouble has been reported in handling these stocks, a fact which may prove invaluable as the synthetics become more plentiful and more generally used.

In these times with increased production necessary, with government contracts let with rigid specifications, and with specified shipping dates to be met, it would be well to insure that an adequate stock of processed liners is constantly on hand to meet the growing demands for rubber products for industrial and war purposes.

Automatic Inspection of Small Parts

A new, improved machine for the inspection of small parts by superimposing images or composite images of objects or gauges to be compared in a manner such that the images are more clear and distinct than those heretofore obtained, has been announced by Designers for Industry, Inc., Cleveland, Ohio.

The new device, which may be used for the inspection of rubber products, according to the designers, is called the "Inspectograph." When equipped with automatic conveyor it will provide for automatic inspection of small parts, rejecting those not exactly like the original, thus solving the inspection problem in some of the war industries.

The device employs a pair of lenses surrounded by spiral coils of gaseous discharge tubes. It employs means for successively energizing these tubes in alternate relation with respect to each other sufficiently rapidly to cause the image projected by each lens to persist as a continuous image.

When used with a screen the perfect part or the gauge can be directly thrown on the screen in one color and then the part to be compared superimposed in a contrasting color. Any differences in width, length or depth of the part as against the gauge or perfect part will be measured by the graduations on the adjustment knobs.

Editorials . . . . . .

Confusion on Rubber

THERE is no doubt that the rubber situation is critical and there is equally no doubt that confusion on the situation exists in Washington. But neither the situation nor the confusion is sufficient reason for certain daily newspapers to condemn official Washington, thus unwittingly contributing to the confusion.

As we have stated in these columns before, we are not interested in laying the blame for the present situation on any individual or group of individuals, but we are most definitely interested in securing results from here on in. And since the synthetic rubber program is the quickest answer to the problem, we are all for that program. That's Washington's job today —to get as much productive capacity going on synthetic rubber as soon as possible.

The newspapers referred to play up the fact that one day a giant synthetic rubber program is announced and the next the threat is raised to requisition tires and even cars. There is no contradiction in such announcements. The mere fact that the synthetic rubber program has been increased is not a guarantee that it will be met. Who is there to say that we will definitely reach productive capacity of 300,000 tons of synthetic by mid-1943? For every technologist who states that that capacity will be reached there is another who denies it and points out the technical difficulties.

Those charged with the rubber program in Washington face one definite fact: The crude rubber stockpile has reached its pinnacle and from now on will dwindle rapidly. Each ton taken from that stockpile will be replaced with only a few paltry pounds. Even when synthetic rubber production reaches respectable proportions the crude pile will diminish since practically every product made from the synthetic requires some crude. Particularly is this true of tire production.

Requisitioning of tires as currently proposed refers only to extra tires other than the four mounted on the wheels and one spare. Thousands upon thousands of motorists are hoarding extra tires, both new and used, and patriotic appeals will not bring out these tires. Unfortunately, therefore, it may have to be declared illegal to own and hold such tires before they can be brought into the market and put to good use. It must be remembered that the government does not want these tires for military use but rather to make certain that essential civilian transportation is provided.

Those familiar with all the facts know how drastic the rubber situation is and are putting in twenty-four days to rectify it. The least the daily press could do is aid this program by constructive criticism instead of adding to the confusion which already exists by picking up statements made by various officials who are not so familiar with the facts but who grow greatly concerned about the situation upon hearing some of the facts from those who know. The American public will not let its fighting men down, even if it means giving up those tires in the back room.

Spread the Gospel

CROWDED highways, parking grounds filled with cars, and empty seats in cars of men and women going to work present evidence of an unthinking attitude on the part of the public where rubber is concerned. These are the words of Paul Litchfield, chairman of Goodyear, whose convictions are based on more than 40 years in the rubber industry and a close familiarity with every major step contemplated or being taken today.

The greatest single reserve of rubber we have today is the million long tons of rubber now in the tires of the 30,000,000 privately-owned automobiles, says Mr Litchfield, and some way must be found to impress this fact upon the public. Members of the rubber manufacturing industry, who have good reason to know the truth in this statement, should do all in their power to spread the gospel. Word-of-mouth advertising has always been the best advertising medium and it is the patriotic duty of every member of the rubber industry to encourage tire conservation.

CURRENT NEWS OF THE MONTH

CONSERVATION OF RUBBER NOW OCCUPIES FULL ATTENTION OF OFFICIAL WASHINGTON

WITH the greater portion of the rubber industry already under rigid regulations as to the products which can and cannot be manufactured and the amount of rubber, latex or reclaim which can go into permissible products, official Washington last month turned its attention to conservation in channels heretofore unaffected. The great problem now is to conserve whatever rubber stocks are now available without too greatly affecting the economy status of the nation. A few additional orders of direct interest to the rubber manufacturing field were issued, including specifications on rubber nipples, and price arrangements affecting camelback and rubber footwear were announced. The frantic hunt for new types of synthetic rubber was continued, and considerable drama was introduced at hearings on the status of the synthetic rubber program. Developments in the field of synthetic rubber, crude rubber, scrap and reclaim, and other branches of the industry are told in detail on following pages.

Of special interest during the past thirty days was testimony given before the Senate Military Affairs Committee on May 6 which brought forth the statement that the committee would approve legislation giving the President authority to seize automobile tires from private owners, and the cars, too, if necessary, to conserve rubber for actual war use. To this authorization, it was said, would be appended a provision establishing a nation-wide speed limit of 40 miles an hour, with confiscation of automobiles as the penalty for violations.

Statement Result of Testimony

The statement was the result of testimony on the rubber situation given by a group of government officials, including Robert P. Patterson, Under-Secretary of War; Leon Henderson, O.P.A. Administrator; Joseph B. Eastman, director of O.D.T.; Arthur B. Newhall, Coordinator for Rubber; and F. Eberstadt, in charge of production of rubber for the Army and Navy Munitions Board. This testimony took several hours and included detailed descriptions of a situation which Senator Reynolds, committee chairman, said was "more serious than has ever been expressed to the people of this country."

The following day, May 7, Under-Secretary Patterson revealed that plans are being formulated whereby extra tires will be purchased by the government from private automobile owners. He defined "extra tires" as all those in excess of five per automobile. He also intimated that requisitioning steps would be taken only in dire emergency. It was learned, too, that the penalty clauses in the proposed requisitioning bill would be greatly modified before such legislation was offered to Congress.

Latest Conservation Moves

In the interest of conservation the W.P.B. on May 7 issued specifications for the manufacture of feeding nipples, designed to save approximately 45 tons of crude rubber annually. The specifications, included in Amendment No. 5 to Supplementary Order No. M-15-b-1, are effective on May 15 and cover the maximum amount of rubber which may be contained in each thousand nipples. The total number which will be manufactured will not be reduced by the specifications.

According to the order, the weight of rubber in each finished nipple of the molded type shall not exceed .0105 pound, while the weight of rubber in all other types of finished nipples shall not exceed .007 pound. The so-called "breast" type nipple, which consumes three times the amount of rubber required to manufacture a nipple conforming to the new specifications, is eliminated as a result of the order.

The amount of elastic fabric that may be used in corsets, girdles, combinations, brassieres, and similar women's apparel, was cut approximately in half by the issuance of Limitation Orders L-90 and L-90-a, issued by W.P.B. on April 23. In addition, the number of garments a manufacturer may cut or knit in any month is limited to 75% of his average monthly production during the three months ended March 31, 1941. Manufacturers, however, are prohibited from using any rubber yarn or elastic thread which was frozen under Order M-124 which was issued on March 28, 1942.

As a result of the new orders, the Apparel Section of W.P.B. estimates that the number of garments which can be made available for women will ultimately be doubled, and that production from present stocks of elastic fabric will be extended by at least eight or nine months. Therefore, it is reasoned, adequate supplies of corsets, girdles, combinations, etc., will be available for many months ahead, particularly since retail stores have large stocks on hand at present. The orders provide different limits for corsets, panty-girdles and combinations of three types, based upon the character and weights of the various elastic materials.

The use of rubber or synthetic rubber in the manufacture of safety equipment was limited by Limitation Order No. L-114, issued by W.P.B. on May 5. Under the terms of the order rubber may no longer be used in the manufacture of such equipment except for the following products: (1) Respirators, hose masks and inhalators, except in head harnesses or straps; (2) Linemen's gloves, overshoes, sleeves and blankets; (3) Webbing for head harness or straps for respirators, hose masks, inhalators and goggles; (4) Goggles for chemical workers. Synthetic rubber, subject to prior confirmation by the Synthetic Rubber Section of WPB, may be used in impregnating safety clothing for handling corrosive materials.

The only exceptions to the order, which covered several strategic materials in addition to rubber and synthetic rubber, were on safety equipment assembled and manufactured prior to the date of the regulation or from parts which were finished and ready for assembly on that date, provided such equipment is to be delivered to fill purchase orders bearing preference ratings of A-2 or higher or equipment assembled or manufactured within 90 days after the effective date of the regulation for delivery to, or for the account of, the Army, Navy or Maritime Commission.

Further Conservation Measures

Acting to save substantial amounts of rubber, W.P.B. assumed rigid control over the production and distribution of all types of rubber-tired construction equipment. More than 70 items of construction equipment normally equipped with rubber tires are affected by Limitation Order L-82-a, issued May 2, which prohibits the future sale, lease, trade, loan, delivery, shipment or transfer of any new equipment without specific authorization of the Director of Industry Operations, except for orders placed

prior to the issuance of the order which carry a preference rating higher than A-2, on which shipments must be made on or before June 1. Last year, the construction machinery industry used approximately 8,000 tons of tires and tubes.

Amendment No. 1 to Supplementary Limitation Order L-26-a, issued by W.P.B. on April 21, directs that production of farm machinery and equipment requiring rubber tires be discontinued after April 30, except for combine harvester-threshers. Production of combines requiring tires must be stopped after July 31.

The use of rubber tires on hand trucks, except for "most essential" uses, was prohibited on May 7 by W.P.B. Effective as of that date, the order bars delivery of rubber-tired hand trucks or tires for such trucks except on specific authorization of W.P.B. Exceptions are granted where the use of tires is necessary to prevent explosion hazards and to avoid accidents in the handling of explosives and damage in transporting delicate machinery or delicate instruments. Hand trucks of all types required approximately 500,000 tires last year. These restrictions will remain in effect until O.P.A. establishes regulations governing their delivery under the tire rationing program. Such authorization was recently granted by W.P.B. to O.P.A.

Amendment No. 1 to General Limitation Order L-43, issued on April 14 by W.P.B., prohibits the use of rubber tires on auxiliary trailers for fire apparatus manufactured or delivered after that date. It was stated that steel-rimmed wheels will be satisfactory for use on the auxiliary trailer units during the emergency.

Prices on Rubber Products

In connection with its general price freezing order issued late in April, O.P.A. on April 28 released a separate list of ceilings on products requiring special price treatment. This list included waterproof footwear and camelback.

Maximum manufacturers' selling prices for camelback are contained in Maximum Price Regulation No. 131, which became effective on May 11. The regulation establishes ceilings over four grades of camelback—Grades A, C, E and F—at the maximum prices that prevailed during March, 1942. Because of restrictions imposed by W.P.B., Grade F, made entirely of reclaimed rubber, is the only grade of camelback at present available for recapping passenger car tires. Ceiling prices for Grades A and C are 28c and 23c, respectively, and 18c for Grades E and F. The volume percentage of crude and reclaimed rubber used in the manufacture of the camelback determines the grade.

Maximum Price Regulation No. 132, which also became effective on May 11, establishes ceilings on manufacturers' wholesale prices for waterproof rubber footwear at the levels that prevailed under voluntary agreement during March, 1942. The voluntary ceiling agreement had been signed by manufacturers who received more than 99% of the crude rubber allocated by W.P.B. for waterproof rubber footwear production during March.

A Waterproof Rubber Footwear Committee was formed by W.P.B. last month, consisting of the following members: George H. Bingham, Jr. (Cambridge Rubber), A. H. Wechsler (Converse Rubber), C. H. Baker (Goodyear Footwear), C. L. Munch (Hood Rubber), L. J. Larkin (LaCrosse Rubber), William Rand (Tingley-Reliance), H. Bullock (Tyer Rubber), H. S. Marlor (U. S. Rubber), F. Petrik (Bata Shoe), M. C. Smith, Jr. (Bristol Mfg.), R. L. Lasser (Endicott-Johnson), C. M. Parks (Goodyear Rubber), and Max Kalter (Servus Rubber).

According to an announcement by the War Department on April 18, savings of 4,869,625 pounds of crude and 7,162,186 pounds of reclaimed rubber have been effected by the Quartermaster Corps in its procurements of footgear for the last 8 months of 1942. This conservation, among the largest in Army history, has been effected by two methods — the revision of specifications so that the rubber heel is eliminated completely from three types of footgear, and revision of specifications resulting in a sharp reduction of rubber in five other items. The largest savings were recorded in service shoes.

Series of Meetings Held

In order to discuss the General Maximum Price Regulation as it relates to all rubber goods except tires and tubes, O.P.A. held a series of meetings early this month with rubber products manufacturers. The first meeting was held in Cleveland on May 6 and was presided over by Ben W. Lewis, chief of O.P.A.'s Rubber Section. It was brought out at that meeting that a special price schedule covering mechanical rubber goods will be issued shortly. A meeting was held in New York on May 7 and another in Boston on May 10.

Earlier in the month W.P.B. announced it had formed a Mechanical Rubber Goods Committee consisting of the following members: W. H. Cobb (U. S. Rubber), F. M. Daley (Sponge Rubber Products), J. E. MacDonald, Jr. (Whitehead Bros.), K. H. Glanton (Dayton Rubber), W. S. Richardson (Goodrich), F. G. Smith (Ohio Rubber), W. L. White (Manhattan Rubber), C. W. Yelm (Gates Rubber), H. P. Schultz (Republic Rubber), P. H. Henkel (Continental Rubber Works), D. E. Harpfer (Goodyear), G. L. Abbott (Garlock Packing), J. H. Hayden (Hewitt Rubber), and A. F. Matheis (Thermoid Co.). C. S. Reynolds is government presiding officer of the committee.

A series of meetings in principal cities throughout the United States has also been arranged by the Office of Defense Transportation and the O.P.A. These meetings are intended to explain the seriousness of the rubber situation to shippers, truckers, tire dealers, and the general public. The first meeting was scheduled for Boston on May 11. Charles F. Phillips, acting chief of O.P.A.'s Tire Rationing Division, will address each of the meetings on "The Battle of Rubber."

Synthetic Rubber

The past month has again witnessed considerable activity in connection with synthetic rubber including an official announcement on April 25 to the effect that the War Production Board has authorized the R.F.C. to provide facilities for an annual productive capacity of 700,000 tons of Buna S synthetic rubber to be in operation no later than the end of 1943. This represents an increase of 100,000 tons in the Buna S program and is in addition to the planned capacity of 100,000 tons for Butyl Rubber and neoprene. W.P.B. also stated that the 700,000-ton Buna S program is to be given all the priority and allocation assistance needed to assure the production of not less than 350,000 tons during the calendar year of 1943.

There are rumors to the effect that the Buna S program may soon be stepped up to 900,000 tons a year. According to a talk given by Charles B. Henderson, chairman of the R.F.C., before the American Bankers Association Credit Clinic in Chicago on April 17, the Rubber Reserve Co., R.F.C. subsidiary, has entered into contracts for synthetic rubber involving approximately $650,000,000.

Official action was also taken with respect to all rubber substitutes of the general type of Koroseal and Vinylite. The issuance of Amendment No. 2 to General Preference Order M-19 on April 29 by W.P.B. places all substitutes of this type under direct allocation. As originally issued and as amended last December, the order included only polymerized vinyl chloride and its co-polymer with vinyl acetate, containing 92% or more of vinyl chloride. The new amendment, however, brings under the restriction all co-polymers of polyvinyl chloride and all polymers and co-polymers of vinyl chloride. The purpose of the latest amendment is to prevent the use of these substitutes for such miscellaneous civilian items as raincoats and shower curtains.

There is considerable mystery and drama concerned with hints and rumors emanating from Washington regarding some new types of synthetic rubber which are said to be superior in performance to present known types and which are capable of being produced at far less cost. It must be remembered that these are strictly rumors and vague reports and no great credence should be placed in their availability.

One of these newer synthetics was brought out in testimony before the agricultural subcommittee of the Senate, headed by Senator Gillette of Iowa as chairman, on April 30. It involved a tale of international intrigue in which a Polish refugee scientist who had a valuable synthetic rubber formula was chased across three continents and finally arrived in the United States through the help of William S. C. Lacy, chief of the O.P.A.'s foreign information unit.

The Polish scientist was Waclaw Szukiewicz, one of the organizers of the Stomil company of Poland which manufactured a synthetic rubber known as "Ker." His formula provides an improved method of utilizing grain alcohol instead of petroleum as the basic material for the production of butadiene. The formula is now reported to be in the hands of the War Production Board.

According to testimony given by Dr. Lewis H. Marks, in charge of research for the Publicker Commercial Alcohol Co., of Philadelphia, which purchased Mr. Szukiewicz's formula after the latter was advised that it was not wanted for the government's synthetic rubber patent pool, an investment of $75,000,000 in the process would provide sufficient butadiene to turn out 700,000 tons of synthetic annually. He revealed that the Publicker concern had constructed a pilot plant at its Philadelphia plant for the Polish refugee to operate and that conclusive proof of the process would soon emanate from this pilot plant.

Butadiene Process Offered

It was also learned that a cheaper and quicker method for processing butadiene from petroleum had been presented to government officials by Eugene Houdry, president of the Houdry Process Corp., of Philadelphia, which is affiliated with the Sun Oil Co. and the Socony Vacuum Co. The new method, according to some officials, will eliminate the delay in the synthetic rubber program and produce synthetic at a fraction of the anticipated cost. No official word on the Houdry process has yet come to light, but considerable importance is attached to the process in certain high quarters.

Experiments with another new type of synthetic rubber which can be produced for one-third the cost of other synthetics are now understood to be under way in Washington. The experiments are being conducted by O.P.A. and tires made from the process are being used on Washington taxicabs. Although O.P.A. officials were wary on details, they did say that if the new product is actually a synthetic it can be placed on the market within a few months, would cost about 15c a pound to produce, and plants for it can be quickly built since they require little steel for construction. They also said the process requires gas reduction plants. Thus far, it was learned, the inventor has refused to disclose details of his process or permitted government officials to witness actual production on the ground that the process has not yet been patented.

Word concerning still another synthetic rubber came to light when police arrested two men charged with abducting and assaulting Dr. Samuel B. Sklar, chemist of New York City, and stealing his formula for synthetic rubber. Dr. Sklar was badly beaten and is suffering from a possible fracture of the skull and lacerations of the face. Although his two assailants were quickly captured, after Dr. Sklar jumped from an automobile in which he had been abducted in Brooklyn, the formula was not recovered.

Synthetic Rubber from Alcohol

The Senate agricultural subcommittee, in addition to hearing the testimony of the Polish refugee and his backers as related above, also heard considerable other testimony during the past month on the subject of producing synthetic rubber from agricultural products. Testifying before the subcommittee on May 8, Secretary of Agriculture Wickard threw his support behind those urging that large quantities of surplus wheat, corn and other commodities be converted into synthetic rubber.

Secretary Wickard told the subcommittee that he was now convinced that use of parts of our reserve stocks of corn and wheat offers the best possibility of greatly increasing our production of synthetic rubber as early as next year. The manufacture of ethyl alcohol from grain is a well established commercial process, he said, while the process of converting 95% alcohol to butadiene is technically established although to his knowledge it has not heretofore been used on a commercial basis in the United States.

According to Secretary Wickard, the Rubber Reserve Co. already has made an allocation for a substantial amount of butadiene to be produced from ethyl alcohol and that a plant for this operation is under construction. About 80,000,000 bushels of wheat or corn would be required to produce 200,000,000 gallons of alcohol, which in turn could produce 220,000 tons of butadiene, he testified. This would make approximately 240,000 tons of synthetic rubber, which is the approximate volume of production which could be obtained from grain through existing distilling plants converted to high proof alcohol production by the use of a minimum quantity of critical metals. Beyond this production, processing facilities would be a limiting factor. Supplies of wheat and corn, however, are sufficient for expanding synthetic rubber production by many times the amount.

In view of these facts, the Secretary said, we should move ahead at once on a program for making synthetic rubber from grain by way of alcohol. There are, of course, other possibilities as well, including methods of making other rubber substitutes from grain that in the long run may prove to be quicker and more efficient. Work in this direction is now centered in the regional laboratory at Peoria, Ill., according to Mr. Wickard, and information is already available on a process which is practicable now.

Production of synthetic rubber from grains was also advocated before the subcommittee by Ralph K. Davies, deputy coordinator of the Petroleum Coordinator's Office, and Wright W. Gary, director of refining for that office, on April 24, providing that synthetic rubber can be produced more readily and cheaply from agricultural products than from petroleum. The subcommittee was told that the oil industry is not anxious to get into the rubber-producing field, and is doing so mainly for patriotic reasons and to see that as much rubber as possible is produced so that automobiles can be kept running. The oil industry, Mr. Gary said, does not consider manufacture of synthetic rubber desirable because it requires the services of too many engineers and chemists and because there are too many other uses for petroleum products.

Commenting on the testimony of these witnesses, Senator Gillette said that the subcommittee has evidence to the effect that industrial alcohol can be produced from grains for 20c a gallon, and as low as 10c if by-products such as casawa starch and protein feeds are utilized, whereas the cost of alcohol from petroleum is 45c a gallon. Senator Gillette also said that there is indication that the petroleum concerns were more or less forced into the synthetic rubber field by the Rubber Reserve Co., which neglected to look into other methods.

Leon Henderson, head of O.P.A. and director of the Division of Civilian Supply of W.P.B., also testified before the subcommittee on April 23 and after the hearing committee members said that the Price Administrator favors the use of grains. Jesse Jones, Secretary of Commerce and R.F.C. head, was scheduled to testify on May 12, and it is believed that his testimony will be heard behind closed doors because of the nature of the questions to be asked. Mr. Jones, incidentally, was completely exonerated of responsibility for the rubber shortage in an interesting article in *Collier's Magazine* for May 15 written by George Creel, noted correspondent and director of censorship in the last war.

More on Biting Process

Additional information on the synthetic rubber process recently advanced by Clarence R. Biting, president of the United States Sugar Corporation, came to light last month. At a dinner held in Clewiston, Florida, on April 21, Mr. Biting announced that he had laid before the government a proposal for producing approximately 10% of the synthetic rubber needed for the war effort. Sugar cane, sweet potatoes and peanuts would be used, he said, and an estimated 100,000 acres of land not now

in cultivation in peninsular Florida would be needed.

The project, according to the sugar executive, would cost approximately $75,000,000, of which farmers would put up $25,000,000 and the government $50,000,000. The contribution of the farmers would be in land, shipping facilities, seed and drainage operations, while that of the government would go toward the construction of processing plants. The process would produce 90,000 tons of synthetic rubber annually at a cost of about 25c a pound. Mr. Biting again stressed the point that the process could be adapted to the production of plastics in the post-war economy.

Other Synthetic Rubber News

Other news concerning the synthetic rubber situation during the past month includes the information that the charter of the Neches Butane Products Co. has been filed in the office of the Secretary of State of Texas. Stockholders of the new corporation, which will produce synthetic rubber under the government program in a plant to be constructed near Port Arthur, are the Gulf Oil Corp., Atlantic Refining Co., Socony-Vacuum Oil Co., Texas Co., and Pure Oil Co. The plant will cost approximately $50,000,000 and raw materials will be drawn from oil refineries in the Port Arthur area.

From Sweden came word that Professor The Svedberg, head of the Physical-Chemical Institute of Uppsala College, and winner of the Nobel Prize in Chemistry in 1926, displayed samples of synthetic rubber made in Sweden from calcium carbide during a speech made in Stockholm on April 23. Professor Svedberg stated that his experiments in the production of synthetic rubber were being carried on independently of formulas, patents and literature on the subject. It is known that the Swedish Government is anxious to launch government-controlled production of synthetic rubber to supplant diminishing stocks of crude now in that country.

Additional news from abroad revealed that the first of two planned synthetic rubber plants in Italy is now in operation. The other is still in the construction stage. One of these plants will produce buna while the other will make use of an Italian method on which no details are yet available. Negotiations are now under way between I. G. Farbenindustrie of Germany and a rubber manufacturer in Rumania for the formation of a new company to produce synthetic rubber from natural gas in the latter country. According to the report, it is planned to produce 3,000 tons of buna annually.

Reclaim and Scrap

In the original order placing scrap and reclaimed rubber under strict regulation issued on March 20 it was ordered that after May 1 products on List F could be made only with the prior approval of the Director of Industry Operations. Because information on which specific allotments could be based was not fully developed, W.P.B. issued Amendment No. 9 to Supplementary Order No. M-16-b on April 27 postponing the original date to June 1. List F includes automotive parts, fan belts, business machine rolls, parts for motor-driven electrical apparatus, and other items generally used in industry. After June 1 production of these items will not be permitted without specific approval.

The use of scrap or reclaimed rubber which is permitted by the formula for the month of May is 60% of an amount comprising the average monthly consumption of scrap or reclaimed rubber in List F products during the last quarter of 1941, plus 166⅔% of the average monthly consumption of crude rubber or latex in the products of the same list in the same period.

Some interesting comments on the reclaim situation were made by William Welch, president of the Mid-West Rubber Reclaiming Co., at the National Salvage Clinic sponsored by W.P.B. in Cleveland on April 22. Discussing the need of the reclaimers for scrap, he first traced the development of the reclaiming industry, stating that through the years reclaimers became essentially tire and tube reclaimers and "we have largely lost the art of reclaiming miscellaneous low grade scrap rubber, and the scrap broker, having been unable to sell these low grades of scrap for the last 20 years, has lost the art of collecting them."

Mr. Welch said that reclaimers need scrap because governmental regulations, essential to the war effort, interfere with peace time buying practices. "The cold, inescapable facts are," he said, "that the government, by regulating the sale of tires and tubes, by creating zones for the purchase of scrap rubber and establishing ceiling prices for these zones, and by various other regulations, has made it absolutely impossible for the purchasing agent of any rubber reclaiming plant to buy an adequate amount of scrap to insure continued operation."

The scrap rubber problem, said Mr. Welch, divides itself into six major phases: (1) The country must be combed for scrap tires and tubes that have been thrown away in remote areas; (2) Scrap tires and tubes thrown away at Army camps must be put into the hands of reclaimers; (3) The few large accumulations of scrap in the hands of dealers must be forced into regular trade channels; (4) Mechanics of getting industrial rubber scrap into trade channels should be provided; (5) Means for collecting household rubber scrap must be found; (6) Hoarded used tires held by motorists should be forced into trade channels, probably by making it illegal to own them.

In concluding his remarks before the Clinic, the Mid-West executive stated that in his opinion the problems enumerated would find the easiest solution if a government-financed "Scrap Rubber Reserve Co." were immediately organized for the purpose of buying or selling scrap rubber. The government would then be the ultimate customer of all scrap rubber in the country and would allocate it to reclaiming plants according to their needs. Although he did not discuss the mechanics of establishing and operating such an agency, Mr. Welch did say that if it seemed desirable to keep reclaim levels at present prices the scrap could be sold to reclaimers at present ceiling prices and any losses incurred absorbed by the government agency.

A plea to double the production of reclaimed rubber was made by J. W. Whitehead, president of the Norwalk Tire & Rubber Co., during the month. Pointing out that there were only 11 reclaiming plants in the United States, exclusive of those operated by rubber manufacturers solely for their own use, and of these 6 manufactured approximately 90% of the reclaim produced annually, one each being located in New York, New Jersey and Connecticut and three in Ohio, he urged that 10 or 12 additional reclaiming plants be established, with government assistance, in strategic areas. Reclaiming machinery, he said, was not complicated and $2,000,000 would equip 10 idle plants, of which there are a great many, for reclaiming purposes.

Mr. Whitehead also said that the ceiling prices on scrap rubber should be removed with those on reclaim left alone, so that the reclaimer would be free to buy scrap at prices suitable to himself. If we double the amount of reclaim produced, he stated, all of the 30,000,000 passenger car owners would have no worries about tires since the 150,000,000 tires now on passenger cars could be retreaded when necessary.

Scrap Rubber Drive Due

In the meantime it was learned that a greatly increased drive for scrap rubber to keep the reclaiming facilities of the industry going at full capacity is being planned by Coordinator of Rubber Newhall. Willard Helburn, former chief of the Rubber Branch of W.P.B., will probably play an important role in this latest effort. Mr. Helburn, it is known, recently completed a personal survey of the scrap rubber situation in the mid-west and laid the groundwork for an extended collection drive. The scrap situation has reached a point where few commercial reclaimers are still operating on a seven or even a six day week.

A comprehensive survey of the scrap materials situation in New England, including rubber, was launched on April 27 by the O.P.A. A staff of representatives is making spot checks at the establishments of New England scrap peddlers, collectors, large and small dealers, and brokers. Analysis of the data gath-

ered is expected to afford O.P.A. a comprehensive picture of the structure of the scrap industry in that area. Many characteristics exhibited in the New England area will be common to those in other scrap producing regions. Future plans contemplate additional surveys in areas somewhat smaller than New England.

The National Association of Waste Material Dealers, Inc., through its Scrap Rubber Institute, is making an effort to substantially increase the collection of all types of scrap rubber and particularly those types that have not heretofore been in demand. Approximately 15,000 letters were sent to dealers throughout the United States. Dealers were urged to collect heels and soles, boots and shoes, drug sundries, rubberized clothing, household goods, etc. Upon request, the Scrap Rubber Institute is prepared to furnish dealers with detailed information as to how to prepare the scrap for reclaimers and to assist them in locating markets if such markets do not exist in their immediate vicinity.

The Petroleum War Industry Council on May 6 pledged its aggressive support to all measures by government agencies engaged in collecting scrap rubber and urged such agencies to use the nation's service stations to bring about a steady flow of scrap to reclaiming plants. The council also recommended that representations be made to proper authorities urging that speed limits on streets and highways be set at a range of 35 to 40 miles an hour.

All dealers selling waste, scrap or salvage material to industrial consumers, which includes scrap rubber dealers, now have to be licensed. The licensing order, Supplementary Order No. 5, was issued by O.P.A. on May 7, becomes effective May 20, and requires registration by the dealers on or before June 20. In announcing the order, Price Administrator Henderson warned that any dealer violating the price schedules or regulations covering waste and scrap materials may have his license suspended, as provided in the Price Control Act, and thereby lose his privilege of doing business.

Crude Rubber

Several additional pacts have been signed between the United States and various South American countries in the past few weeks, all designed to bring greater quantities of crude rubber to this country as soon as possible. These included the following:

Jesse Jones announced on April 23 that the Rubber Reserve Co. has concluded arrangements with the Government of Peru for the establishment of a fund of $1,125,000 to be used by the Peruvian Amazon Corporation, owned and operated by the Government of Peru, for the purpose of increasing wild rubber production. Under the terms of the agreement, the Rubber Reserve Co. is to acquire all of the rubber produced in Peru over a period of five years, except that which is needed for essential use in the country itself.

A somewhat similar agreement was made with Nicaragua. In exchange for all the rubber that Nicaragua can export up to the end of 1946 the United States has agreed to establish credits of $500,000 to the Banco Nacional de Nicaragua for experimental and development work. This agreement, negotiated with Dr. Mariano Arguello, Nicaraguan Foreign Minister, now in this country, was signed by the Rubber Reserve Co. on May 4.

In accordance with the agreement signed between the United States and Brazil last February, Brazil announced on April 30 that it was suspending all rubber exports except those to the United States. This covers both crude rubber and manufactured products. Under this agreement, all raw rubber will be sold to the Rubber Reserve Co. except that needed by Brazilian rubber factories. Rubber Reserve has the right to allocate any part of this excess crude to any country it so wishes. On May 6, U. S. Ambassador Caffery announced in Rio de Janeiro that an agreement had been reached to establish a price of 39c a pound, f.o.b. Belem, for washed and dried Upper Acre Fine.

Word was received from Caracas, Venezuela, on April 30 to the effect that large loads of rubber were arriving at Puerto Ayacucho in the Amazonas Territory. Exploitation of wild rubber in Venezuela practically stopped after 1918 but Indian tribes are again tapping based on a promise by the government to pay 35c a pound.

Trial Plantings of Guayule

In the meantime the guayule project launched by the Department of Agriculture is moving along smoothly. According to Fred S. McCargar, secretary of the Salinas, Calif., Chamber of Commerce, who has long been interested in the development of domestic guayule, over 100 districts in the United States will have trial plantings of guayule in the near future. These small acreages will be located in Texas, Arizona, New Mexico and California. The plantings are under the direction of Dr. W. G. McGinnis of the Southwest Forest District, Forestry Service, Department of Agriculture. Approximately 750 acres at Salinas are being devoted to nurseries where 500,000,000 seedlings will be grown to be transplanted to from 45,000 to 50,000 field acres in 1943.

In addition, according to Mr. McCargar, various experimental plantings are being tried under the Spence plan of sowing the seed thick and harvesting this fall and also under the Lee plan of sowing the seed and thinning the young plants just as is done with lettuce. The seed collecting system is being completely revised and it is hoped to have sufficient seed to plant several hundred thousand acres under the Spence plan in 1943 if that plan proves feasible.

A number of men are out testing soils and checking rainfall in various states for the 1943 plantings. Under the present plan, the government is renting the land, but in some instances is paying the farmers to prepare the land and do the cultivating. The government will do the planting and harvesting. Land must be in large acreages because of the heavy machinery which requires fields a minimum of one-half mile in length. It is also necessary to secure from 10,000 to 12,000 acres in a unit because due to the bulk of the product it cannot be hauled great distances.

A warning to the effect that the public may as well resign itself to the fact that rubber cannot be produced at any reasonable cost from ordinary farm crops or weeds was issued on April 27 by Dr. D. R. Dodd, extension agronomist of Ohio State University. Referring to the fact that goldenrod, milkweed and even Osage orange contain some quantity of rubber, he emphasized the point that the Department of Agriculture has experimented for years with all of these plants and had reached the decision that they all were uneconomical from the standpoint of extraction of the rubber.

Little further was heard regarding the *Kok-Sagyz* situation except that appeals for seeds made by the government to the Soviet Union had resulted in the sending of some seeds via airplane and that six tons of seed are being sent by boat. According to W. H. Mason, public relations director of the General Tire & Rubber Co., the seeds coming by boat will arrive in time for spring planting at a chain of test stations that will extend from Portland, Maine, to Portland, Oregon.

Tires and Tubes

Tire regulations continue to flow from Washington in a steady stream as the rubber situation grows more serious. Of special importance in the past few days was the broadly-phrased executive order issued by President Roosevelt on May 2 giving the Office of Defense Transportation, headed by Joseph B. Eastman, power not only over the movements of all defense vehicles but also authority over the rationing of tires and gasoline insofar as these relate to the best utilization of motor vehicles. The order presumably also permits O.D.T. to set nation-wide speed limits if it deems them necessary to restrict rush-hour movements of automobiles, or apply any other restrictions on non-essential transporation which can be enforced.

Specifically, the executive order instructed the O.D.T. to "include within the scope of its authority and responsibility . . . all rubber-borne transportation facilities, including passenger cars, buses, taxicabs and trucks," and to "formulate measures to conserve and assure maximum utilization of the existing supply

of civilian transportation services dependent upon rubber."

Immediately after the issuance of the executive order, John L. Rogers, Director of the Division of Motor Transport of the O.D.T., issued a warning to the effect that failure to take proper care of truck tires can produce a "transportation bottleneck" and urged truck drivers and owners to safeguard their present tire supply. Stating that the present supply of tires and tubes is in reality the nation's most important stockpile and reserve, Mr. Rogers said that until there is a replenishment of rubber stocks driving practices must be adjusted to conform with approved tire conservation rules. These rules were previously issued by the O.D.T.

Tying-in with the President's order to the O.D.T., the W.P.B. on May 5, in Supplementary Directive 1 F, directed the O.P.A., in exercising rationing authority with respect to tires, passenger cars, gasoline, or other products used in transportation, to implement to the full extent administratively practicable the transportation policies of the O.D.T.

Authority to ration all types of tires for all purposes, including industrial equipment, was delegated to the O.P.A. by the W.P.B. in Amendment No. 1 to Supplementary Directive No. 1-B, issued on May 6. Under previous delegations, O.P.A. had power to ration tires for commercial use, but some confusion existed as to the jurisdiction over tires for certain types of industrial equipment. The new directive makes it clear that such power resides in the O.P.A.

The amendment also extended the rationing power in the hands of O.P.A. to cover all tires, whether made of crude, scrap or reclaimed rubber, or "any of the substances commonly known as synthetic rubber." Excepted from O.P.A. control by the amendment are tires to be sold for military use or export, or tires for use on airplanes. W.P.B. also retains control of tires for vehicles in the hands of manufacturers, distributors and retailers.

May Quotas Are Released

The May quotas for tires and tubes, released by O.P.A. on April 24, made available recapping certificates for List A passenger cars and motorcycles for the first time since rationing was instituted. The quota provided only 55,573 new tires for List A passenger vehicles, but included 578,092 recapped tires upon which List A eligibles have first call, with the remainder available to List B users. The entire April quota provision for List A passenger vehicles was 101,636 new tires, with a separate quota of 470,317 recapped tires for List B. List A and B cars together were assigned a tube quota of 315,058 for May, against 285,977 in April.

The truck tire quota for May provided 238,259 new and 379,060 recapped tires for eligible trucks, buses, farm equipment and industrial tractors, compared with 275,523 new and 246,442 recapped tires in April. The truck tube quota for May was 328,836, against 260,983 in the previous month. In releasing May quotas, O.P.A. again emphasized the fact that there is no difference in quality between the camelback for use on List A passenger vehicle tires and that for List B eligibles. Under present regulations this camelback is made almost entirely of reclaimed rubber.

A report issued by O.P.A. on April 29 indicated that based on full returns from all states only 45% of new passenger tires alloted for January was absorbed, only 68% in February (based on reports from 13 states), and 83% in March (based on reports from 12 states). On the basis of the same reports, percentages applying to new truck tires were 46% in January, 79% in February, and 91% in March. Savings made in these early months of rationing may be looked upon as an addition to the vitally important inventory for later use, according to O.P.A. officials.

Tire manufacturers, meeting with O.P.A. officials in Cleveland on May 1, urged a liberalization of rationing rules to permit the faster movement of obsolete-size and cheaper grade tires from manufacturers' stocks. Specifically, the manufacturers asked that all tire sizes for cars of 1935 or earlier model be classed as obsolete. Sizes for 18 and 19-inch rims would be in this classification. Tire manufacturers are believed to have approximately 8,000,000 tires in their factories and warehouses which, according to Charles Phillips, assistant tire controller of the O.P.A., is a sufficient supply for three years' rationing.

Allow Tire Price Advances

Permission for price increases to cover the cost of the Government's tire return plan, which was set up to check bootlegging of tires and tubes and to relieve retailers and jobbers of the financial burden of carrying large stocks in a shrunken market, was granted the trade through the issuance of Amendment No. 1 to Revised Price Schedule No. 63 on April 23 by O.P.A. Under the terms of the amendment, maximum retail prices for new tires and tubes of passenger car sizes are increased 16%.

Manufacturers and mass distributors will be permitted to advance their wholesale prices by the actual dollar amounts of the 16% increases in the retail ceilings. The voluntary maximum price agreement with O.P.A. has been relaxed to allow for the advances. Since truck tires were not included in the return plan, no price adjustment was necessary for such tires.

Following a study of the operating experiences of tire companies in January and February of this year, the O.P.A. issued Maximum Price Regulation No. 119, effective April 27, establishing maximum prices on original equipment tires and tubes for automobiles and trucks. The regulation allows 5% increases over levels that prevailed throughout 1941. Prices on original tires and tubes for farm equipment are not to be advanced and will continue at the 1941 levels.

Amendments to Regulations

Since our last issue four additional amendments to the Revised Tire Rationing Regulations have been issued by O.P.A., as follows:

Amendment No. 5, effective April 22, allows an emergency reserve of tires and tubes equal to 10% of the total number of running wheels on qualified vehicles —in addition to spares already permitted. This amendment applies particularly to long-distance bus and truck operators and is designed to save time and rubber in carrying vital materials.

Amendment No. 6, effective April 22, permits buses to be used on special trips to carry entertainers and other participants in organized morale-building recreational activities to and from Army and Navy establishments without losing eligibility under List A. At the same time, provision is made for List A trucks to make deliveries to ultimate consumers when these do not entail special trips or diversions from normal routes, and are only incidental to the performance of eligible services. Such deliveries were heretofore expressly forbidden. The amendment also limits the eligibility of some vehicles and expands that of others.

Amendment No. 7, effective May 1, states that new tires will not be available for List A vehicles after May 1 when use of a recapped tire is practical, and that no tires at all will be released after June 1 to anyone who abuses those he now has in use. In the case of vehicles operated in hazardous services where the safety factor is a consideration, the local rationing board may issue a new tire certificate at its discretion.

Amendment No. 8, effective May 1, provides that vehicles used to tow house trailers from the factory to sites where they are necessary as living quarters for war workers are now eligible for tires under List A. The amendment provides that the tow car must not be used for other than List A purposes and limits the length of haul for a house trailer to 200 miles, although written consent can be secured from the State Rationing Administrator for longer hauls.

Additional Tire Rulings

In addition to the above amendments to the rationing regulations, the following decisions affecting tires and tubes were made during the past month:

O.P.A. announced that the names of Federal Government intelligence officers whose work depends upon secrecy will be withheld hereafter by local rationing boards when they release lists of recipients of tire purchase certificates.

An order from the O.P.A. on April 19 permitted the release of retreaded or recapped passenger car tires "frozen" in the hands of retreaders since February 19 to any of their owners who can qualify for retreading certificates. Special instructions were issued as to procedure.

Under the terms of Amendment No. 7 to Limitation Order No. L-1-a, effective April 25, the W.P.B. made it possible to equip heavy trucks produced under existing quotas with tires and tubes. The amendment rescinds the prohibition against putting tires and tubes on new heavy trucks except for delivery to dealers. Only trucks having a gross vehicle weight of 16,000 pounds or more are eligible under the amendment. Approximately 5,000 trucks can be equipped immediately.

Tires Without Rubber

Considerable interest was stirred in layman circles with the issuance of reports that the larger tire manufacturers were experimenting with "rubberless" tires. According to word from Akron, Goodyear now has test cars on the road which are "running on tires made without rubber." Company officials refused to even hint at the materials contained in the new tires. Executives of Firestone and Goodrich indicated that their respective research departments were also experimenting with similar tires, but refused further comment.

Development of a tire with only 1/16th of the amount of rubber formerly used was announced by the Ford Motor Co. on April 14. A company spokesman said the tire was composed largely of a fabric specially treated with a new formula, but declined to discuss the fabric further. Nothing has been heard of this new tire since the original announcement.

The Ministry of Economic Warfare in England recently announced that experiments in making cork tires are being carried out in France and Holland and that manufacturers in Denmark are producing composition paper tires for bicycles. Wooden-wheeled motor buses are being tested in Budapest, it added.

Miscellaneous Regulations

A number of miscellaneous rules, regulations and definitions of specific interest to the rubber industry has been issued in recent weeks, including the following:

General Preference Order No. M-134 assigns a preference rating of A-2 to purchase orders for cotton textile fabrics from which tape is made. Certain constructions of osnaburgs, sheetings, print cloths, card lawns and tubings as fabrics suitable for the manufacture of cloth and tape are specified. Industrial cloth or tape, according to the order, falls into three groups: Varnished cambric tape, friction tape, and carton tape.

Distribution of naphthalene is placed under rigid allocation control by the terms of Conservation Order M-105. After June 1, all deliveries except for certain exempted deliveries must be made in accordance with schedules to be issued by W.P.B. at the beginning of each calendar month.

The use of benzene, the principal source of styrene, needed for the production of the Buna S type of synthetic rubber, is halted in motor fuel under the terms of Conservation Order M-137. The order specifically exempts benzene used in the production of aviation fuel with an octane rating higher than 87.

Limitation Order L-100 places heavy compressors, urgently needed for the war production program, including the production of synthetic rubber and toluene, under a system of complete allocation. The placing or accepting of orders for compressors covered by the regulation is prohibited unless specific authorization is made on special forms.

The electric heating pad order (L-84) was amended on April 16 to permit manufacturers to use up inventories which cannot be used for other purposes. Production must be stopped entirely on June 30. It is believed that a sufficient number of heating pads will be on hand by the time of the shutoff to meet demands for the remainder of the year.

An A-10 rating was extended on chlorinated hydrocarbon solvents when used in certain specific applications, including the processing of rubber. This change in preference rating was covered in an amendment to Order No. M-41.

Under a ruling of the Board of Economic Warfare, all rubber and rubber manufactures may now be shipped under general license to Canada. The Canadians, however, are controlling the importation of rubber and rubber products, and will require in addition to import permits that the invoice, taken up by the Canadian Customs, state the crude rubber content.

Goodyear to Produce Planes

For the past several months the Goodyear Aircraft Corp., subsidiary of the Goodyear Tire & Rubber Co., has been turning out parts on an increasing scale for five of the nation's major airplane manufacturers. In addition to continuing to supply such parts to other manufacturers, Goodyear will also produce full fighting aircraft, according to an announcement made by the company on April 21. A huge new factory from which these completed craft will be turned out is now under construction in Akron and the first complete plane will be produced before the end of the year. The type of plane to be made was not divulged.

Auction Crown Rubber Assets

Assets of the Crown Rubber Co., Fremont, Ohio, were offered at public auction in Fremont on April 21. Among machinery offered were mixers, tubers, hydraulic presses, accumulators and pumps. Real estate owned by the company, including a modern brick one-story factory building, was also sold. The sale, occasioned by voluntary liquidation of the owners, was in the hands of the Industrial Plants Corp. of Toledo, Ohio.

DATA ON MILKWEED RUBBER IS FURNISHED BY SHARPE

The present status on the production of rubber from Vergata milkweed was recently disclosed by associates of William A. Sharpe, of Alhambra, California, to a correspondent of RUBBER AGE. The principal data was furnished by D. B. Lewis, head of the D. B. Lewis Co., machinery manufacturers of 3402 Avalon Boulevard, Los Angeles, whose office represents Mr. Sharpe.

300,000 Acres Are Planned

According to Mr. Lewis, present plans call for the cultivation of approximately 300,000 acres of Vergata milkweed during 1943 to supply special extracting plants to be erected. The weeds grow from 10 to 15 feet in height. About 7,000 plants per acre will be set out and the yield, depending on soil and location, will run from 15 to 30 tons per acre.

Milkweed rubber, or Caliverde Rubber as Mr. Sharpe terms it, is said to compare favorably with plantation grades. In fact, according to Mr. Sharpe, milkweed rubber has certain advantages, notably higher protein content, greater density, resistance to oil, less resin content, and superior resiliency.

The system worked out by Mr. Sharpe includes harvesting the weeds in the green state, extracting the juice by crushing in presses and allowing the juice to stand for seven days when it is siphoned off and stored. The secret of the process is said to be the innoculation of the juice with a certain form of bacteria. Mr. Sharpe points out that the employment of bacteria in the manufacture of some products, such as cheese, has long been established as practical, and that the use of bacteria is as yet in its infancy. He maintains that it took six years of experimentation to secure the results he has now achieved in creating latex by bacterial process from the juice of the milkweed.

Care Required in Compounding

From the 15 to 30 tons per acre yielded by the milkweed plant, says Mr. Sharpe, from 1,000 to 2,000 pounds of rubber can be secured. This rubber can be utilized on existing rubber machinery and equipment, the only additional care being that required in compounding. The high nitrogeneous content of the plant indicates that fully 80% of the substance for growth is taken from the air and only 20% from the soil. This means but small drain on soil fertility.

While the development of machinery is in the hands of the D. B. Lewis Co., actually no specially designed machinery is needed. Regular farm harvesting machinery can be used for harvesting the milkweed and simple type presses and storage vats used for extracting and storage purposes. Centrifuges are utilized, but in no new form. Mr. Sharpe is credited with having developed many new items, including a process for the manufacture of carbon black.

A.S.T.M. RUBBER COMMITTEE DEVELOPS EMERGENCY CHANGES

Since the procedure was established late in 1941 by the American Society for Testing Materials for preparing Emergency Provisions and complete Emergency Specifications or tests, a number of such actions have been developed by A.S.T.M. technical committees. All of these changes and the new specifications have one aim, namely, the expediting of procurement and conserving critical or strategic materials during the national emergency.

The first of a number of emergency changes developed by Committee D-11 on Rubber Products has been made in the requirements for insulated wire and cable: Class A0, 30 per cent Hevea rubber compound (D-27) which provides that the conductor can be coated with tin, lead, or lead-alloy. Reference is also made to the new emergency specifications for lead-alloy coated copper wire ES-1, which gives tests for continuity and related properties.

A number of the emergency modifications relate to the cable cotton tape, one of which provides that instead of being frictioned on both sides and thoroughly filled with a rubber compound, it "shall be treated on one side with an insulating compound of a nature not injurious to the wire insulation." Since these specifications are referred to in three other standards for insulated wire performance: rubber compound (D-353), heat-resisting rubber compound (D-469), and ozone-resistant type insulation (D-574), the changes also affect these specifications.

In the specifications for insulated wire and cable (D-353) important physical test requirements have been modified reducing the tensile strength from 1200 to 850 min. psi.; elongation at rupture, 300, instead of 400 per cent; and a marked reduction in the tensile strength after 48 hours in the oxygen pressure test of 600 psi. min. Other physical requirements are being deleted for the emergency.

Correspondingly in the requirements for rubber sheath compound (D-532) tensile strength is being reduced from 3500 to 3000 psi. min.; elongation at rupture from 500 to 400; requirements on tear resistance and tensile strength at 200 per cent elongation are being deleted.

The committee also considered modifications in the specifications for cotton rubber-lined fire hose (D-296) and after further study in the subcommittee it is expected emergency changes will be approved.

As is the case with all other A.S.T.M. emergency revisions these proposed by Committee D-11 are in the interest of expediting procurement or conserving critical or strategic materials during the emergency.

A contract for the construction of a new plant in Northern New York has been let by the Farrel-Birmingham Co. Cost of the new structure is estimated at $4,000,000.

Osberg Joins Wilmington Chemical

Edward V. Osberg, associated with the editorial staff of the *India Rubber World* since November, 1937, most recently as executive editor, has resigned to join the Wilmington Chemical Corp., Wilmington, Delaware, manufacturers of "Naftolen," as vice-president in charge of sales and technical service. He will be located in the company's New York offices at 10 East 40th Street.

The new Wilmington Chemical executive received his education at Brewster Academy, Wolfeboro, N. H., and Brown University, Providence, R. I., where he majored in chemistry. He later took a special course in colloid chemistry at M.I.T. under Dr. Ernst A. Hauser. In 1930 he joined Simplex Wire & Cable Co. as assistant rubber research chemist, subsequently being placed in charge of the development and application of latex to insulated wire.

Reorganize Testing Laboratories

The plant and equipment of Electrical Testing Laboratories, which were offered for sale in February, have been acquired by the Electrical Testing Laboratories, Inc. The new company was organized by the employees of the old one and now offers the same type of service to government and industry. Preston S. Millar remains as president of the reorganized concern which functions in the fields of electrical and general testing, inspection, analysis, research and certification. The address is 2 East End Ave., New York City.

Blue Ridge Plant Destroyed

The plant of the Blue Ridge Rubber Co., wholly-owned subsidiary of the Cambridge Rubber Co., at Tanneytown, Maryland, was completely gutted by fire of unknown origin on April 26. The block-long factory was destroyed after the fire had raged uncontrolled for several hours. Damage was estimated at "$500,000 or higher." The plant normally employed between 1,100 and 1,200.

LOS ANGELES HEARS TALKS ON ASTRONOMY AND GLASS

An instructive discussion on astronomy given by Dr. Edwin P. Hubble of the Mount Wilson Observatory and one on glass given by J. R. Roland of the Owens-Illinois Pacific Coast Company featured the meeting of the Los Angeles Group, Rubber Division, A.C.S., held at the Hotel Mayfair in Los Angeles on May 5. Dr. Hubble spoke on "Exploration of Space" and Mr. Roland on "No Bottlenecks in Bottles." The latter showed motion pictures illustrating methods of control practiced in the production of glassware. He laid special stress on the value of glass as an insulating material. Approximately 125 members and guests attended the meeting.

Door prizes included a $25.00 war bond donated by the Farrel-Birmingham Co. through H. F. Parkerton, manager of the Los Angeles office, and war stamps in the amounts of $3.75, $5.00 and $10.00, purchased by the group from its own funds. These prizes were won by Phil Drew (Goodyear), G. L. Walther (J. R. Gardner Co.), Bob Grimes (Dill Mfg.), and Herman Libkind (Western Insulated Wire).

A special prize, fog lights donated by the Arrowhead Rubber Co. through Harry Franklin, went to L. F. MacDonald, treasurer of the group. Plastic golf tees, presented by the C. P. Hall Co. through Bob Abbott, local representative, were distributed, while table favors were donated by the Desser Tire & Rubber Co.

Incidentally, the mechanical trouser hangers distributed as table favors at the April meeting, credited to Martin, Hoyt & Milne in the last issue, were actually donated by the Binney & Smith Co. through the former concern, which represents Binney & Smith on the coast.

Twenty-one new members, 19 of whom were present, were voted into the group at the meeting, with T. Kirk Hill officiating over the impressive initiation ceremonies. It was agreed that the membership of the group had now reached a respectable figure and that less effort to make it larger would be expended in the future. It was emphasized, however, that membership is still available for those who wish to join and qualify.

The last supper meeting of the current season will be held at the Hotel Mayfair on Tuesday, June 2. Meetings are suspended over the summer, with various sporting events being held.

Court Upholds Huber Company

The Fifth Circuit Court of Appeals at New Orleans, La., handed down a decision on May 7 affirming the previous decision of the Federal District Court of the Northern District of Texas to the effect that J. M. Huber, Inc., is not infringing the patents of Godfrey L. Cabot, Inc., on pelletizing carbon black. The suit was brought by Cabot about three years ago.

HOLT AND CARPENTER ADDRESS 1942 INTERNATIONAL MEETING

E. G. Holt, Chief of the Rubber Staff, Bureau of Foreign & Domestic Commerce, U. S. Department of Commerce, and Arthur W. Carpenter, Manager of Testing Laboratories for the B. F. Goodrich Co., now acting as rubber consultant to the Bureau of Industrial Conservation of the War Production Board at Washington, D. C., were the principal speakers at the Annual International Meeting of the Buffalo Group, Rubber Division, A.C.S., the Ontario Rubber Group of the Canadian Chemical Association, and the Quebec Rubber & Plastics Group, now affiliated with the Montreal Section of the Society of Chemical Industry, held at the General Brock Hotel, Niagara Falls, Canada, on April 30. This is the first international meeting in which the Quebec group has participated. Approximately 215 members and guests were present.

The meeting was officially opened by John S. Plumb, of the U. S. Rubber Reclaiming Co., chairman of the Buffalo Rubber Group, who first introduced all of the members and guests seated at the speakers' table, including John S. Street (Firestone), J. T. Blake (Simplex Wire), and H. I. Cramer (Sharples Chemicals), chairman, vice-chairman and secretary, respectively, of the Division of Rubber Chemistry, A.C.S., who were invited guests.

The program was later taken over by Dr. Norman S. Grace, of the Dunlop Tire & Rubber Goods Co., chairman of the Ontario Rubber Group, who introduced W. R. Walton, Jr., works manager of the Dunlop concern, who is also chairman of the Canadian Rubber Conservation Commission. Mr. Walton spoke a few words of welcome and then introduced the second speaker, Mr. Carpenter. In his brief remarks Mr. Walton stressed the similarity between rubber restrictions and regulations in the United States and Canada.

Holt Discusses Rubber Trends

Taking as his subject "The Trend in the Rubber Industry," Mr. Holt reviewed the entire rubber situation and as usual did an excellent job. He first discussed the many ramifications which accompany a shortage of rubber, including the loss of employment and its relation to purchasing power, pointing out that revenues lost by curtailment of automobile usage must be replaced by increased taxes of some kind.

Mr. Holt emphasized the fact that the rubber situation was more serious than the lay public or even the rubber manufacturing industry seemed to realize and urged that every possible effort be made to secure crude rubber. Expressing approval of cultivation efforts in Latin America, he stated that unfortunately the past history of countries in that sphere was against the possibility of greater immediate shipments, irrespective of the price paid for the rubber. Then, too, he said, the rubber manufacturing industry in Latin America has increased considerably in recent years to the point where such countries now require large supplies for their own use.

Discussing guayule, Mr. Holt said that of all efforts to secure new and increased sources of supply of natural rubber the guayule project launched by the Department of Agriculture was the best, if not too bright, prospect for immediate supplies. He pointed out that guayule cultivation in this country was defensible, urged large plantations, and expressed the opinion that deresination costs will be considerably reduced once large scale harvesting is inaugurated.

Coming to the status of the Axis countries where rubber is concerned, the speaker stated that Japan is now gutted with rubber but has no markets for it. There is a good probability, he said, that Japan may soon offer rubber to Russia, to China, and even to some of the Latin American countries. As for Germany, that country is beginning to show signs of crude rubber needs as indicated by recent desperate attempts to have ships run the blockade. The rubber trees now in Japanese hands, said Mr. Holt, probably will not be destroyed, but there is little doubt that once these trees are again in the possession of the British and the Dutch it will take some time to restore them to proper tapping conditions.

The reclaimed rubber position was next discussed by Mr. Holt. He cited statistics indicating how important reclaimed rubber was to the war effort and said that every effort would have to be made to continue reclaiming plants at full capacity. There was plenty of scrap rubber available throughout the country, but its collection was somewhat difficult. He urged every one of his listeners to talk scrap in their communities, organize collection efforts, get the assistance of local groups, and in some way start scrap moving. He intimated that national collection efforts were being organized in Washington.

As to the status of synthetic rubber, Mr. Holt referred to the latest figures from the War Production Board which has thus far set a goal of 800,000 tons per year. He said that to reach such an annual capacity within the next two or three years will test American resources to the utmost, but that the job must be done. He urged rubber manufacturers to experiment with as much synthetic rubber as they could lay their hands on and to freely exchange information regarding processing developments with their friends and competitors in the spirit of the war effort. Stating that history represented a series of "ages" he predicted an "age of synthetics."

In answer to the question, "What can rubber chemists do to aid the war effort?," Mr. Holt said that the first thing they could do was use scrap, reclaimed, inferior grades of crude, synthetics and crude rubber in that order whenever possible. He urged that the chemists, with the cooperation of their superiors, adopt voluntary restrictions in keeping with performance requirements. He also urged that they do everything possible to prevent destruction of rubber, which is now prohibited in the United States by law.

In concluding his talk, Mr. Holt predicted that whereas in the immediate past an average compound may have consisted of 75 parts of crude, 24 of reclaimed and 1 of synthetic, those in the near future may consist of 65 parts of synthetic, 25 of reclaimed and 10 of crude. Therefore, he said, it was to every chemist's advantage to learn as much as possible about the synthetic rubbers as soon as possible.

Carpenter Discusses War Effort

Mr. Carpenter, the second speaker, discussed "Rubber and the War" and first outlined the organizational set-up in Washington, briefly defining the functions of the War Production Board, Office of Price Administration, Rubber Reserve Co., Metal Reserve Co., and the Defense Plants Corporation. He explained how each of the seven divisions of the W.P.B. are concerned with rubber, including his own bureau, the Bureau of Industrial Conservation, and touched lightly on his work in that bureau. He explained that Arthur Newhall's new status as Coordinator for Rubber would be of considerable help in welding together the work of the various sections concerned with rubber, including the Consumer's Division of O.P.A. which is charged with conservation of rubber in consumer hands. He also described the difference between the limitation, conservation and priority orders issued by the government and defined "war orders."

Mr. Carpenter agreed with Mr. Holt that the rubber situation was very serious and said that the point may be reached where we may have to give up rubber footwear and other rubber products completely in order to produce military products. He urged his listeners to be "good soldiers" come what may. He stressed the point, however, that the W.P.B. is not a high-handed agency but is doing its utmost to maintain essential civilian production. The right to appeal any decision of the board is granted to all manufacturers, but in making such appeals he suggested that the full case be stated and justification shown in the light of the war effort.

Stating that present supplies of latex were large, he said that such supplies must be carefully conserved since no new latex could be expected for at least two years and suggested the use of dispersions wherever possible. As to scrap rubber, he indicated that the salvage program was expanding and revealed that Willard Helburn, ex-chief of the Rubber Branch of W.P.B., was now engaged on this problem. Allocation of scrap rubber was probable, he intimated,

while requisitioning would be instituted if necessary to maintain reclaiming plants at full capacity. In this connection he said that it was the government's intention to make complete use of available equipment rather than to enter or encourage plant expansion.

Included among other remarks made by Mr. Carpenter was the suggestion that synthetic rubber products be so marked that they can be properly and easily classified in the future when they turn up in scrap channels. Synthetic rubber can be reclaimed, he said, but such reclaiming presents special problems. He also urged that materials such as leather, cork, asbestos, plastics, resins, fabrics, wood, etc., be substituted for rubber wherever possible, citing several cases of such substitution, one of which was a typewriter platen made of Vinylite scrap, heretofore a waste material. In concluding his talk, Mr. Carpenter stated that in his belief synthetic rubber was the only answer to our immediate problem and predicted that processing difficulties will be overcome.

Meeting in Buffalo Definite

At the conclusion of Mr. Carpenter's address, Dr. Grace, presiding chairman at the time, asked Mr. Street to say a few words in his capacity as chairman of the Rubber Division, A.C.S. Mr. Street then stated that the Division was lining up a complete and interesting program for its next meeting which will definitely be held in Buffalo next September in conjunction with the 104th meeting of the parent society. He stated that the executive committee had been in touch with the W.P.B. at Washington and had a tentative promise that some interesting facts on synthetic rubber will be presented at the meeting by some official of the Rubber Branch.

New York Group Has Meeting

A meeting of the New York Group, Rubber Division, A.C.S., was scheduled to be held on Friday, May 15, at the Building Trades Club in New York. Two speakers were scheduled, J. Miscall, sales engineer of the Flintkote Co., on "The Place of Rubber Dispersions in the War Effort", and H. I. Cramer, of Sharples Chemicals, Inc., who is also secretary of the Rubber Division, A.C.S., on "Review of Synthetic Rubber." The program also provided for some entertainment and the distribution of door prizes. A full report will appear in the next issue.

Detroit Group Hears Somerville

Dr. A. A. Somerville, of the R. T. Vanderbilt Co., New York, was to be the principal speaker at a meeting of the Detroit Rubber & Plastics Group, scheduled to be held on May 8 at the Hotel Detroit Leland in Detroit, Mich. Dr. Somerville was to speak on "The Development Status of Synthetic Rubbers." A complete report on the meeting will appear in the next issue.

Call Off S.A.E. Meeting

Continued presence of diplomats of enemy countries at White Sulphur Springs and the inability of railroads to guarantee sufficient Pullman accommodations for members to meet at any other suitable place, have ruled out holding the geared-to-war meeting of the Society of Automotive Engineers this summer. The papers that were to have been presented at this annual meeting, however, will be given at a number of local meetings sponsored by the S.A.E.'s National Activity Committee, and many of them will be published in the July issue of the *S.A.E. Journal.*

Fire Destroys Scrap Tires

Approximately 200 tons of scrap tires awaiting reclaiming at the plant of the Nearpara Rubber Co., in Trenton, N. J., were destroyed by fire which broke out on April 28. Twelve fire companies fought the blaze which was brought under control within a few hours. Morris Rosenthal, vice-president of the company, stated that the fire may have started from a lighted cigarette thrown into the yard and estimated damages at $3,000. The fire was confined to the yard and did no damage to the reclaiming plant.

Akron to Hold Outing

The Akron Group, Rubber Division, A.C.S., will hold its annual outing as usual this year. The outing will be held on Friday, June 19, at the Fairlawn Country Club. A golf contest will feature the activities.

Quebec Rubber Group Meets

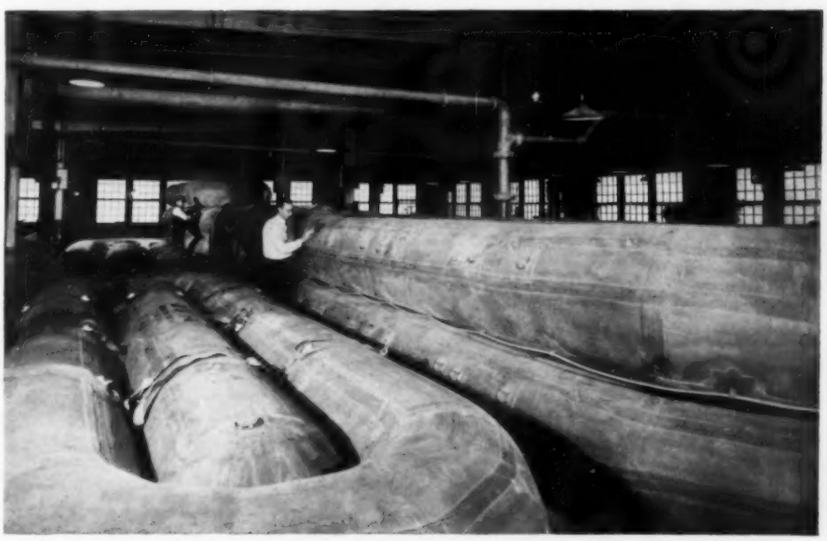
The Quebec Rubber & Plastics Group, now affiliated with the Montreal Section of the Society of Chemical Industry, was scheduled to hold a meeting on May 8 at the Ritz Carlton Hotel in Montreal, Canada. A. E. Byrne, plastics sales engineer of the Canadian General Electric Co., and a member of the Plastics Advisory Committee of Canada under the Chemical Controller, was to have spoken on "Plastics." Election of officers was also scheduled. A full report of the meeting will appear in the next issue.

To Build Plant in Peru

Authorization has been received by the Goodyear Tire & Rubber Co. from the Government of Peru to establish a plant in that country for the manufacture of tires, tubes and other rubber products. According to word from Peru, the authorization was granted "because of the world situation, and the need for economic development of the country, as well as the interests of continental defense." No comment has been received from Goodyear officials.

R. G. Seaman Joins "World"

Robert G. Seaman, chemist, associated with the U. S. Rubber Co. for the past 15 years, the last 11 of which have been spent at the Providence, R. I., plant, has joined the *India Rubber World* as Technical Editor. Edward V. Osberg, until recently Executive Editor of the *World*, recently resigned to join the Wilmington Chemical Corporation as vice-president.



Pneumatic floats or pontoons made of rubber and fabric are designed specifically for use with the army's armored units. They are used to construct bridges over which the medium 28-ton tank can cross rivers in safety and are made with compartments separated by bulkheads so that in case of a hit on any part the remaining compartments will support the load. The float shown above, made by Goodrich, is being inspected prior to shipment.

NAMES IN THE NEWS

C. E. GUNN, of the brokerage firm of Robbins, Gunn & Co., has been elected a vice-president of the Aetna Rubber Co., Cleveland, Ohio. CHARLES MASHEK is president of the company.

E. A. STEVENS, formerly managing director of the Goodrich Co. (S.S.), Ltd., rubber buying subsidiary of the B. F. Goodrich Co. in Singapore, has been named assistant to the director of purchases at the home plant in Akron. H. C. BUGBEE has been appointed manager of the crude rubber division.

CHARLES F. FISK, development chemist, U.S. Rubber Co., Providence, R. I., has been transferred to the Department of Product Quality Control at the Ordnance Plant the company is operating in Des Moines, Iowa. JEROME SCHAUL, JR., recently accepted a position as supervisor of the physical testing laboratory at the same plant.

G. J. IRWIN, formerly associated with the B. F. Goodrich Co., and before that an engineer in the Ohio State Highway Department, has been named senior engineer of the Defense Plant Corp., R.F.C. subsidiary. He has been assigned to the planning and construction of plants to be erected under the government's synthetic rubber program.

R. M. SALTER, associated with the Department of Agriculture for the past several years, has been named chief of the Bureau of Plant Industry, succeeding DR. E. C. AUCHTER, recently appointed administrator of the Agricultural Research Administration under which SECRETARY OF AGRICULTURE WICKARD recently grouped eight research agencies of the department, including the Bureau of Plant Industry.

E. R. COYLE, formerly sales manager of the resin and solvents division of the Neville Co., Pittsburgh, has joined the Diamond Magnesium Co., Painesville, Ohio, as purchasing agent.

EVERETT W. PRICE, formerly assistant treasurer of the Woburn Degreasing Co. of N. J. (and also of Massachusetts), has been elected treasurer of those companies, succeeding ALEXANDER H. BEARD, who retired due to the press of activities in other business.

CLEVELAND E. DODGE, vice-president of the Phelps Dodge Corporation, was elected a director of the B. F. Goodrich Co. last month, to succeed ARTHUR B. NEWHALL who resigned as a director and a member of the executive committee at the time he was appointed Coordinator for Rubber.

J. H. MATTHEWS, assistant general manager of the Manhattan Rubber Manufacturing Division, and O. H. CILLEY, assistant general manager of the U.S. Asbestos Division, have both been elected to the board of directors of Raybestos-Manhattan, Inc.

HARRY F. WEBSTER, who has been vice-president and general manager of the Denman Tire & Rubber Co., Warren, Ohio, has been promoted to the rank of president of that company succeeding W. B. MCCANDLESS, who has resigned to take up duties with the Navy as a lieutenant commander on board the *U.S.S. Prairie State*, a training ship.

E. J. W. FINK, president and general manager, Mishawaka Rubber & Woolen Mfg. Co., Mishawaka, Indiana, has been appointed to the Indiana State Salvage Committee, representing the rubber industry.

W. J. O'BRIEN, JR., associated with the Seamless Rubber Co., New Haven, Conn., for several years, has been named chief chemist of that company, succeeding L. D. ACKERMAN who has been assigned to special procurement work for the concern.

H. W. HOUK, purchasing agent, Nitro, W. Va., plant, Rubber Service Department, Monsanto Chemical Co., has been transferred to a similar position with the Texas Division of the company. The Texas Division has under its supervision the construction of a plant for the manufacture of raw materials for synthetic rubber under government contract. Mr. Houk will be stationed in Texas.

C. I. COLLINS, formerly district manager for the American Steel & Wire Co., at Worcester, Mass., has been named executive vice-president of the Wickwire-Spencer Steel Co., New York City. American Steel & Wire operates an insulated wire and cable plant at Worcester.

DAVID C. SCOTT, JR., of the Henry L. Scott Co., Providence, R. I., has entered the service and will serve with the Navy.

WILLIAM MCCORNISH has been appointed general manager of the Stoughton, Mass., plant of L. Albert & Son, dealers in second hand and rebuilt machinery for the rubber, plastic and other industries.

LOWELL D. SMITH, vice-president of the Sponge Rubber Products Co., Derby, Conn., has retired from that concern and has sold his holdings to his associates in the firm.

LESTER W. BROCK, until recently associated with the C. P. Hall Co. of Akron as New England representative, has joined the Continental Carbon Co. and will work out of the Akron office of that company under CARL J. MINNIG, vice-president in charge of sales.

PAUL E. COLLETTE, secretary- treasurer of the Oak Rubber Co., was elected chairman of the Industrial Division of the Ravenna (Ohio) Chamber of Commerce last month. The division will attempt to bring additional war contracts to Ravenna factories.

H. I. CRAMER, secretary of the Rubber Division, A.C.S., now associated with Sharples Chemicals, Inc., Philadelphia, addressed a joint meeting of the Technical Club of Syracuse and the Syracuse Section of the A.C.S. at Syracuse on March 16 on the subject of synthetic rubber. He made a similar address before a meeting of the Philadelphia Section, A.C.S., on April 16.

CYRUS CHING, director of industrial and public relations, U. S. Rubber Co., has been made an alternate employer member of the War Labor Board replacing L. N. BENT, vice-president of Hercules Powder Co. Mr. Ching has been acting as an associate member of the board.

ROBERT S. MCFADDEN, formerly with Vansul, Inc., has joined the Industrial Tape Corp., New Brunswick, N. J., as research rubber chemist, replacing D. J. BUCKLEY who left to join Standard Oil at the Esso Laboratories for development work on Butyl Rubber.

JOHN P. "JACK" COE, general manager of the Naugatuck Chemical Division of U. S. Rubber Co., and vice-president of Dispersions Process, Inc., was also named head of a new synthetic rubber division organized by U. S. Rubber last month to handle the operation of the synthetic rubber plant now being constructed at Naugatuck, Conn., under government contract.

GEORGE W. CASSELL, superintendent of the Rubber Department of the Perth Amboy, N. J., plant of the General Cable Corp., has been transferred to the Buffalo plant as plant manager. JOHN DUGAL, formerly assistant to MR. CASSELL at Perth Amboy, has been named superintendent of that plant.

W. H. MORLEY, plant manager of the Pawtucket, R. I., plant of Anaconda Wire & Cable Co., has been made assistant general manager of all plants, with headquarters at Hastings-on-Hudson, N. Y. T. S. JOHNSON is general manager. J. EAGLESON, who was superintendent at the Pawtucket plant, is now plant manager. WILLIAM H. BASSETT, Anaconda metallurgist, stationed at Hastings-on-Hudson, has resigned to enter the service as a Captain of Ordnance.

Government Needs Technologists

About a year ago the Federal Civil Service Commission began a recruiting drive for technologists. The number of persons on the employment lists now established is not sufficient for today's wartime needs. Accordingly, the Commission has recently reissued the announcement of these opportunities for Government employment with slightly modified requirements. Salaries for the positions range from $2,000 to $5,600 a year. Applications may be filed until further notice with the Commission's Washington office.

By technologist the Commission means a person experienced in "the necessary production, engineering, and scientific research work essential for the successful operation of an industrial plant, where such plant operation is based upon a thorough and expert knowledge of a branch of an applied science", such as explosives, fuels, plastics, rubber, minerals, or textiles.

For the Junior positions ($2,000 a year), applicants will no longer have to take a written test, and, as before, no written test will be given for the higher positions. The maximum age limit for all the grades has been raised to 60 years. Copies of the announcement (No. 188), and the forms for applying, may be obtained at first- and second-class post offices, or from the Civil Service Commission, Washington, D. C.

Reports from Akron indicate that Goodyear expects to introduce a substitute material for Pliofilm for civilian use within the next few months. The new material will contain no rubber but a large amount of plasticizer. The use of Pliofilm is currently restricted to war purposes.

General Atlas Carbon, 60 Wall St., New York City, has made available its Baseball Schedules Calendar for 1942. In addition to showing schedules, the booklet lists miscellaneous information on baseball. Copies are free for the asking.

The Franklin Institute, of Philadelphia, awarded a Certificate of Merit to the Goodyear Tire & Rubber Co. on April 15 for its "development and successful manufacture of a safety tire which lessens the risk of damage to life and property caused by tire blowouts." Specifically, the award covered the development of the LifeGuard safety tube. Approximately 1,500,000 of these tubes have been sold since 1935.

Development of a superior type of hard rubber from Ameripol is reported by the B. F. Goodrich Co. Ameripol hard rubber, it is said, will stand temperatures 100° F. higher before softening than the best hard rubber made from natural crude.

Coming Events

June 2. Los Angeles Rubber Group, Hotel Mayfair, Los Angeles, Cal.

June 19. Akron Rubber Group, Outing, Fairlawn Country Club, Akron.

June 22-26. A.S.T.M., 45th Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

Sept. 7-11. 104th Meeting, A.C.S., Buffalo, N. Y. Rubber Division Headquarters: Hotel Lafayette.

Nov. 17-22. Second National Chemical Exposition, Stevens Hotel, Chicago, Ill.

Cabot Makes Reprints Available

Godfrey L. Cabot, Inc., 77 Franklin St., Boston, Mass., has made a number of reprints of articles appearing in recent issues of various trade and technical journals available. These include: "Surface Area and Properties of Carbon Black," by W. R. Smith, F. S. Thornhill and R. I. Bray, which appeared in the October, 1941, issue of *Industrial & Engineering Chemistry;* "The Electrical Resistance of Carbon Black Inks," by F. H. Amon and O. J. Brown, Jr., from the November, 1941, issue of *American Ink Maker;* and "Effect of Reinforcing Pigments on Rubber Hydrocarbons," by F. S. Thornhill and W. R. Smith, from the February, 1942, issue of *Industrial & Engineering Chemistry.* Copies of these reprints are available on request to the company.

E. O. Denzler, until recently associated with the Tyer Rubber Co., Andover, Mass., is now with the Acushnet Process Co., New Bedford, Mass., as chief chemist.

Ray Evans, associated with the Hazard Insulated Wire Works Division of the Okonite Co., Wilkes-Barre, Penna., for the past several years, has been named technical manager of that plant to succeed the late Thomas W. Gangloff.

C. A. Hubner, of the American Hard Rubber Co., and P. L. Dildine, of the B. F. Goodrich Co., were among the speakers scheduled to discuss production problems at the Spring Production Conference of the American Management Association at meetings at the Hotel Astor, New York City, on May 13 and 14.

J. J. Blandin, manager of the crude rubber department of the Goodyear Tire & Rubber Co. and vice-president of that company's rubber growing subsidiaries in Sumatra, was presented with a special plaque recently to commemorate thirty years of service with the firm.

A.S.M.E. Group to Meet

The Subdivision on Rubber & Plastics, Process Industries Division, American Society of Mechanical Engineers, will hold its next meeting at the Hotel Statler in Cleveland on Monday, June 8. Two sessions will be held, one in the morning and the other in the afternoon. Four technical papers will be given, two on plastics in the morning and the other two on rubber in the afternoon. Titles of the papers and their authors follow: *Bearing Strength of Plastics,* James Bond, Department of Mechanical and Industrial Engineering, University of Kansas; *Some Mechanical Properties of Plastics and Metals Under Sustained Vibrations,* B. J. Lazan, School of Engineering, Pennsylvania State College; *Synthetic Rubber Applications and Unusual Physical Properties,* O. D. Cole, Firestone Tire & Rubber Co.; *Special Rubber Compounds for Highly Individualized Applications,* Dan Bradley, Harris Products Co.

Tubing designed for use as electrical insulation by manufacturers in the electronic, instrument, aircraft, electrical appliance and powder industries has been given the name Fibronized Koroseal Tubing by the Irvington Varnish & Insulator Co., Irvington, N. J. The advantages of the material are said to include inside and outside smoothness, exceptional elasticity, and close manufacturing tolerances.

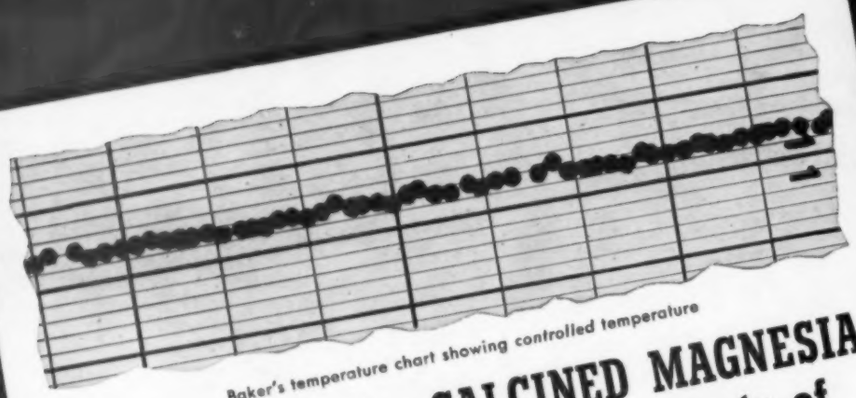
"Will America Have to Jack Up Its 29,000,000 Automobiles" is the title of an interesting little booklet written by John L. Collyer, president, B. F. Goodrich Co., Akron, now being distributed by that company. It is full of facts and figures and helpful ideas on conservation of tires and other rubber products.

The Labor-Management Committee for the War Production Drive at Goodrich has started publication of *War Production News.* The new house organ will be published weekly. The committee, formed at the request of Donald Nelson, head of W.P.B., consists of six representatives of the U.R.W.A. and six representing the Goodrich management.

The rubber laboratory of the Titanium Pigment Corp., formerly located at Sayreville, N. J., has been moved to 99 Hudson St., New York City, where the company's paint and other laboratories are located.

The Rubber Manufacturers Association, 444 Madison Ave., New York City, has made available composite orders of W.P.B. orders M-15-b and M-15-b-1. These composite orders, which include all amendments thus far issued, obviate the necessity for searching through several amendments to determine latest effective provisions. A limited supply of the composite orders are available on request.

WAR-TIME DEMANDS FOR bring



Baker's temperature chart showing controlled temperature

How Baker's CALCINED MAGNESIA meets the exacting requirements of NEOPRENE COMPOUNDERS

Special, custom-built electric ovens manufacture Baker's light Calcined Magnesia. This electric-controlled Calcining Process gives definite uniformity and eliminates possibility of oxide contamination from products of combustion. The temperature chart above shows the unvarying temperature (never more than 5° variation) in these special ovens. This controlled temperature is a major reason for these features of Baker's Calcined Magnesia—so essential to Neoprene compounding:

1. *Uniformly* GOOD WETTING POWER OR EASE OF INCORPORATION.
2. *Uniform* DISPERSION with IMPROVED STABILIZING EFFECT.
3. *Uniform* QUALITY—that is maintained in MOISTURE-PROOF PACKAGING.

Baker's *Light* CALCINED MAGNESIA

(MAGNESIUM OXIDE)

TEST IT YOURSELF! COMPARE!

NEOPRENE COMPOUNDED PRODUCTS

new sales opportunities to many companies!

Now...more than ever before...it is important to be sure of a UNIFORM Calcined Magnesia and a dependable source of supply

"Give us more Neoprene compounded products." Every day, the request grows stronger with war-time demands and shortages of rubber.

The sharp rise in the use of Neoprene makes it *doubly important* for Neoprene compounders to make sure of (1) a *uniform* Calcined Magnesia and (2) a dependable source of supply.

Baker gives you *uniformity* in every batch of Calcined Magnesia. And you can look to Baker and rely on Baker as a dependable source of supply.

Baker's light Calcined Magnesia — from the brine wells right on through to the controlled temperature, so essential to *uniformity*—is manufactured especially to meet the exacting needs of Neoprene compounders. Test it in ease of dispersion—stability of compounded stock—rate of cure—tensile strength and plasticity!

And remember—Baker safeguards delivery of *uniform* Calcined Magnesia. Moisture-proof packages bring you this product with its *uniform* quality maintained. Send today for free samples.

and MAGNESIUM CARBONATE, too

The Rubber Industry, too, will be interested in Baker's Magnesium Carbonate with reinforcing qualities resulting in high tensile strength, set, abrasion resistance, etc.

Baker's Magnesium Carbonate is uniformly clean —manufactured to rigid specifications, both chemical and physical. Needle type crystal gives definite control for reinforcing characteristics. Production is continuous assuring users of closely regulated uniformity. Send for free samples.

J. T. BAKER CHEMICAL CO., *Phillipsburg, N. J.*

Cartons are corrugated, tough, waterproof! All edges are taped—providing complete protection against moisture!

Strong 4-ply bags are asphalt-interlined and tape-sealed—a further barrier against moisture infiltration!

SEND FOR FREE SAMPLES---TODAY!

CANADIAN NEWS

Although no further official announcements have been made concerning the size or location of the polymerization plants in which synthetic rubber will be produced for the Dominion of Canada, it is now understood that the proposed program contemplates production of some butyl rubber as well as the Buna S type. First announcement of the plans of Polymer Corporation, Ltd., government company in charge of synthetic rubber operations, indicated that only the Buna S rubber would be made, but it is now believed that capacity for about 6,000 tons a year of butyl will also be provided.

Canadian rubber manufacturers will have to content themselves with the "institutional" type of advertising for the duration of the war, according to Alan H. Williamson, Controller of Supplies. In line with the rubber conservation program, an order will be issued putting definite limitations on the advertising and display of restricted rubber goods.

In indicating that such an order was in the making, Mr. Williamson said, "Rubber is our gravest concern at the moment and we are anxious to do every thing we can to discourage people from buying its products which are not absolutely essential. The display of rubber products, with the probable exception of rubbers in season and medical supplies in store windows, will not be allowed. Nor will dealers be permitted to display them prominently on shelves or tables. All reference to rubber products must be excluded from hand bills."

Henry William Schultz, of the Goodyear Tire and Rubber Company of Canada, Ltd., New Toronto, has been appointed director of used tires and other rubber goods in the Used Goods Administration.

"Ted" Douglas, for the past several years a member of the mechanical sales division of the B. F. Goodrich Rubber Company of Canada, Ltd., Kitchener, has recently been appointed head of that company's newly created Koroseal sales department.

Kitchener friends of Murray C. Bartlett, Goodrich technical man who has been working at the main factory in Akron for the past two years, were recently surprised to learn that "something new has been added." When Mr. Bartlett returns to the Kitchener plant in the near future he will be accompanied by Mrs. Bartlett, the former Mary Hoehn, of Akron.

The Sterling Rubber Company, Ltd., Guelph, Ontario, has reported net profits after taxes of $21,031 for 1941 compared with $19,446 in 1940. After payment of dividends, a surplus was left of $9,531 which compares with a surplus in the previous year of $7,946. The earned surplus carried forward now amounts to $79,673. Current assets of the company are reported as $140,840 and current liabilities as $53,779, leaving a working capital of $87,061. During 1941 the regular 6½ per cent dividend was paid on the preferred and $2 a share on the common.

Last year, the business of the Goodyear Tire and Rubber Company of Canada was the largest in the history of the company, according to a statement made recently by A. G. Partridge, president, at the annual meeting. Sales were "substantially increased" in 1941 over any previous year but the average margin of profit was lower due to the large proportion of war sales on which profits are small.

For the year ending December 31, the company had a net profit after deducting taxes and depreciation of $1,603,089 compared with $1,391,514 for the previous year.

Payment of dividends amounting to $293,908 on the preferred shares and $1,286,300 on the common left a surplus of $22,881. From this, plus the previous surplus of $8,324,493, was paid a bonus on the common stock amounting to $385,890, leaving a surplus carried forward of $7,961,484.

Last year the company paid out $4,200,000 in taxes compared with $2,500,000 in 1940. Mr. Partridge made no attempt to forecast what the present year would bring. At present the tire plant at New Toronto is running at close to capacity on war business but the mechanical goods plant at Bowmanville has been severely curtailed in its operations.

Although imports of crude rubber into Canada amounted to 9,625,417 pounds in February, compared with 8,446,866 in the same month of the previous year, the total imported for the first two months of 1942 was only 10,059,683 pounds, a decrease of 55.4% as compared with the first two months of 1941.

Sub-Lieutenant Norman M. Simpson, 24, son of James I. Simpson, president and general manager of the Dunlop Tire and Rubber Goods Company, is reported to be the youngest commander of any ship in the Royal Canadian Navy. When the war started, young Simpson dropped his law studies, attended a special naval course at Sunnyside, Toronto, and joined the R.C.N. in May, 1941. He is now in charge of one of Canada's submarine chasers.

U. S. Rubber Expands War Efforts

According to reports from Marion, Ohio, the U.S. Rubber Co. will assume management of the operation of the Scioto Ordnance Plant, located near that city. The plant manufactures munitions. U.S. Rubber is already operating a small arms plant in Des Moines, Iowa, and will operate a T.N.T. plant now under construction in Pennsylvania. F. B. Davis, Jr., president of the company, told stockholders meeting in Jersey City, N. J., on April 21 that one of the company's tire plants is scheduled to make parts for 105 mm Howitzer guns, another to turn out airplane wing assemblies, and still another to produce self-sealing fuel cells. One of the footwear plants, he said, will make perishable tools for small arms ammunition while a general products plant will manufacture battery jars for submarines. One of the company's textile mills, that formerly spun cotton into tire cord, will now make it into Army duck.

Easley Appointed Sales Engineer

M. K. Easley, associated with the American Zinc Sales Co., Columbus, Ohio, since 1921, has been appointed sales engineer for that company. Originally in charge of the rubber laboratory, Mr. Easley became closely associated with the plant operations of the American Zinc Oxide Co. and was instrumental in the development and control of processes. In his new capacity he will have the responsibility of coordinating plant operations with sales. Mr. Easley is particularly known in the rubber field as an expert microscopist.

Introduce New Carbon Black

The introduction of Continental "AA", a new carbon black for military, bus and truck tires, has been announced by the Continental Carbon Co., New York. The new black is said to assure lower heat generation in these tires and to provide an excellent balance between wear resistance and heat generation. In addition, according to the manufacturers, Continental "AA" is easier processing than the standard grades formerly furnished for passenger car tire use.

C. S. Band, vice-president of Gutta Percha and Rubber, Ltd., has been elected a director of the Toronto General Trusts Corporation.

Goodyear Tire and Rubber Co. of Canada has turned out a number of all-reclaim tires at its New Toronto plant. P. W. Richards, general sales manager, points out that these are in the nature of experimental tires and are not being offered for sale at this time. Service will be much inferior to that given by natural or synthetic rubber tires and, in any case, it is probable that reclaim will not be permitted for such use.

LOS ANGELES NEWS

Carl E. Stentz, of the Sierra Rubber Co., addressed the dinner meeting of the National Gasoline Association in Los Angeles on May 7 on the subject, "Natural vs. Synthetic Rubber Today." His talk covered the various materials now used in the manufacture of the different types of synthetic rubber. Mr. Stentz, who owns a rubber manufacturing company of his own, is now connected with the compounding department of the Sierra concern.

The new pan reclaiming plant of the Kirkhill Rubber Co. was scheduled to begin operations on May 20. T. Kirk Hill, president of the company, was slated to leave Los Angeles on May 18 on a trip which would include Chicago, Detroit and Dallas. He was to visit the company's sales branch in Chicago, superintend the start of construction of a warehouse in Detroit, and visit the plant of the Arrowhead Rubber Co. of Texas in Dallas. The Dallas plant, opened only a few months ago, is said to be operating 24 hours a day. Sterling Atchison was recently made manager of the plant.

The Kirkhill company has been expanding its operations steadily since the turn of the year and is now operating three shifts. The company now has well over 500 employees. Gross volume in April was the largest in the company's history.

J. K. Fleshman, who has done a good job in Los Angeles for the U. S. Rubber Co. in connection with the plant for the manufacture of bullet-proof gasoline tanks, has left for the East where it is understood he will occupy an executive position in connection with one of the newer synthetic rubber plants.

Bill Layman, who has been purchasing agent for Firestone at the Los Angeles plant, has joined the service.

Herman Jordan, coast representative of DuPont, left early in May for a visit to the home offices in Wilmington, Delaware. Vic Vodra, local sales representative of the R. T. Vanderbilt Co., has also left for a visit to the east during which he will visit at the home office of the company in New York City and the laboratory in East Norwalk, Conn.

U. S. Rubber and Goodyear are cooperating in the Training Within Industry program which is rapidly gaining momentum in the Los Angeles area. John B. Calhoun, working under the direction of W.P.B., is in general charge of the work in this area.

John B. Watson, one of the partners operating the Goodyear Rubber Co. of San Francisco, has joined the Air Corps and is currently stationed at a training field in the vicinity of his home. Howard Middleton, his co-partner, is seriously ill at St. Francis Hospital in San Francisco at this writing.

Oliver Baalson, foreman of the press room for the Atlas Sponge Rubber Co., has joined the Army and is now undergoing training in the mechanized forces. Howard Lien, proprietor of the firm, is at present handling his work. This company, which moved into its present plant about a year ago, has been doing considerable war work.

The Faulhaber Rubber Co. has adopted the practice of closing its plant on Saturdays.

Karl F. Dunkel, who returned from Australia about a month ago, after having spent about two years in that country, has joined the Sierra Rubber Co.

Launch War Production Drives

Included among the first 500 plants in the United States to set up voluntary labor-management committees and launch war production drives, in accordance with the suggestion advanced by Donald M. Nelson, W.P.B. chief, announced by the Office for Emergency Management on April 17, were plants operated by the following rubber manufacturers: Kirkhill Rubber, Los Angeles; Whitney Blake, New Haven; American Steel & Wire, Worcester, Mass.; General Cable, Perth Amboy, N. J.; Western Electric, Baltimore, Chicago and Kearney, N. J.; National Battery, Depew, N. Y.; Goodrich, Akron; Goodyear, Akron and Los Angeles; Seiberling Rubber, Akron. Several of the DuPont plants were also included.

Zinc Oxide Sales Increase

Sales of lead-free zinc oxide in 1941 were the highest recorded since 1929, according to figures released by the U.S. Bureau of Mines. A total of 145,865 short tons was produced and 148,833 tons (valued at $18,558,474) sold. This compares with 116,709 tons produced and 113,213 tons (valued at $13,361,980) sold in 1940. Sales by industries in 1941 were recorded as follows: Rubber, 90,429 tons; Paint, 30,304; Ceramics, 8,596; Floor Coverings and Textiles, 6,991; Other, 12,513. Of the total lead-free zinc oxide produced in 1941, 76% was from domestic ore, 13% from metal, 11% from scrap, and a fractional per cent from foreign ore. Sales of leaded zinc oxide in 1941, amounting to 68,920 short tons, established a new high record by a wide margin. Only one short ton of this zinc oxide was used by the rubber industry.

National Chemical Exposition

More than 60% of all available exhibition space, which is double the area of the first show held in December, 1940, is already under contract by leading firms throughout the country for the Second National Chemical Exposition which will be held from November 17 to 22 at the Stevens Hotel in Chicago under the auspices of the Chicago Section of the American Chemical Society. The technical sessions held in conjunction with the exposition are now being arranged and full details will be made available shortly. Victor Conquest, director of research for Armour & Co., is chairman of the show committee. Marcus W. Hinson, who managed the first exposition, is acting in a similar capacity for the 1942 show, headquarters for which are maintained at 110 North Franklin St., Chicago.

Establishes Pacific Coast Offices

In order to establish and maintain direct contact with its customers on the Pacific Coast on the same basis as in the east, the Titanium Pigment Corporation has opened its own offices in Los Angeles and San Francisco. The Los Angeles office is located at 2472 Enterprise Street, and is in charge of E. G. Burling, while the San Francisco office is at 350 Townsend Street, with R. Lee Wharton in charge. In the future all orders and correspondence in reference to Titanox pigments, heretofore directed to the National Lead Co.—Pacific Coast Branch, will be received at the new offices.

APPROVED BY RUBBER CHEMISTS

SOUTHEASTERN CLAY COMPANY, AIKEN, SOUTH CAROLINA

OBITUARIES

William A. Brubaker

William A. Brubaker, general manager of the Akron Gear & Engineering Co., of Akron, Ohio, and one-time employee of the Miller Rubber Co., leaped to his death from the High Level Bridge in Akron on April 23. He was 59 years of age and had been in ill heath for some time. Mr. Brubaker had been associated with Miller Rubber from 1913 to 1917 during which time he achieved some prominence in the development of the manufacture of toy balloons. He also experimented with tire building machinery and was the recipient of several patents. Funeral services were held on April 26 with interment in Greenlawn Cemetery, Akron. He leaves a widow, three sons and two daughters.

Louis W. Hottel

Louis W. Hottel, sales manager of the Pacific Hard Rubber Co., Los Angeles, and widely known in western rubber circles, died at Los Angeles on April 3 after a short illness. Mr. Hottel was born at Fredericksburg, Indiana, in July, 1880, and had been associated with the Vulcan Rubber Co., Rub-Tex Products, Inc., and the Richardson Co. at various times. Funeral services were held on April 4 in Los Angeles with interment later in Salem, Indiana. He leaves a widow and son.

Sylvanus Hicks, Jr.

Sylvanus Hicks, Jr., who served as general sales manager of the Arabol Manufacturing Co., of New York, manufacturers of latex and other cements and adhesives, until his retirement last September due to ill health, died on April 16 in Mary Immaculate Hospital, Jamaica, N. Y. He was 51 years of age. Mr. Hicks was associated with Arabol for more than thirty-three years. He leaves a widow and a daughter.

Clark Rubber Corp. Dissolved

The Clark Rubber Corporation, 680 North Olden Ave., Trenton, N. J., manufacturers of molded goods, recently filed a certificate of dissolution with the New Jersey authorities. The company, of which S. K. Young, 9 Rockefeller Plaza, New York City, was president, was organized in 1940.

Charles E. Wood Moves

The offices of Charles E. Wood, Inc., dealer in crude rubber, balata and allied products, formerly located at 140 Cedar Street, have been moved to 52 Wall Street in New York City. The new telephone number is HAnover 2-0122.

Washington Appointments

J. W. Bicknell, managing director, Plantations Division, U. S. Rubber Co., has been granted a leave of absence from that position to join the Rubber Reserve Co.

Frederick P. Jecusco, resident technologist for the Boston Woven Hose & Rubber Co., Cambridge, Mass., since November, 1940, and prior to that manager of the Mechanical Fabrics Co., Providence, R. I., an affiliate of U. S. Rubber, has joined the General Machinery Section of W.P.B.

Acquires Hy Grade Rubber Plant

The plant of Hy Grade Rubber Products, Inc., at Salem, Mass., was recently acquired by L. Albert & Son, second hand machinery dealers of Trenton, Akron and Los Angeles. The plant was established in 1940 and made heels and soles and some mechanical goods. Harry J. Donovan, of the former Donovan Rubber Co., was president of the Hy Grade company.

"World" Moves Headquarters

Effective May 1, the offices of the *India Rubber World*, and all other Bill Brothers publications, were moved from 420 Lexington Avenue to 386 Fourth Avenue, corner of 27th Street, in New York City. The telephone number remains unchanged as MOhawk 4-1760.

Statistics

In cooperation with the authorities in charge of the war effort, RUBBER AGE has discontinued the publication of certain vital statistics. Accordingly, and until further notice, the Statistical Section will be published every other month only. In the months the section does not appear permissible data will be given in the news pages and this data may be appended to that appearing in the previous issue. The Statistical Section will be brought up to date in the subsequent issue. Data to be added to that in the April, 1942, issue follows:

Casings: Production in the month of March, 1,156,410 units; shipments, 1,027,021; and inventory at the end of the month, 4,809,123.

Tubes: Production in the month of March, 1,129,259 units; shipments, 986,228; and inventory at the end of the month, 5,025,878.

Cotton: The average price of middling uplands on the N. Y. Cotton Exchange for the month of April was 21.10c, based on 25 trading days.

FINANCIAL

Monsanto Chemical Co.

First Quarter: Net income after provision for Federal income and excise profits taxes including provision of $810,000 for possible additional taxes amounted to $778,910, equal to 45c a common share. Net income before provision for income taxes amounted to $4,385,364. Sales and earnings in the first quarter of the year, before provision for income taxes, were the highest in the history of the company.

General Cable Corporation

First Quarter: Net profit of $946,052 after provision of $3,784,000 for Federal income and excess profits taxes, equal to $6.31 each on 150,000 shares of 7% preferred stock on which unpaid dividends amount to $52.50 a share. This compares with $1,006,006, or $6.70 a preferred share, reported for the first quarter of 1941.

I. B. Kleinert Rubber Co.

For 1941: Net profit of $411,043, equal to $2.52 each on 162,958 common shares, excluding 27,042 shares held in the treasury, which compares with $143,757, or 87c a share on 164,140 common shares, reported for the previous year. The 1941 report did not include earnings of the company's English subsidiary.

Converse Rubber Company

Year Ended Jan. 31: Net income of $151,585, which compares with $16,978 earned in the previous year. For the year ended January 27, 1940, the company reported earnings of $2,775, which equalled 16c each on 17,742 shares of $2.00 preferred stock.

Anaconda Wire & Cable Co.

First Quarter: Preliminary report shows net income of $548,235 after provision of $3,236,080 for Federal income and excess profits taxes, equal to $1.30 each on 421,981 shares of common stock. This compares with $748,811, or $1.77 a share, last year after income and excess profits taxes of $808,727.

An agreement establishing minimum wages and means for settling disputes has been signed by the Eagle Rubber Co., Ashland, Ohio, and Rubber Workers Local 22625, affiliated with the A. F. of L.

A department to handle sales of rayon in the Central and South American markets has been organized by the U. S. Rubber Co. John D. Clarke, as director of sales for the U. S. Rubber Export Co., Ltd., will direct activities.

Muscles for Rubber

RUBBER is a fighting word in this World War . . . a fighting product made harder, and tougher, and longer-lasting by *reinforcement with carbon black.*

Tanks, trucks, aeroplanes, artillery and naval units, in scores of different ways, depend upon rubber reinforced with carbon black for much of their fighting efficiency, maneuverability and stamina.

Carbon black literally puts "muscles" in this combat rubber. It strengthens it, toughens it and lengthens its life.

It makes our Army, Navy and air equipment fight better and last longer.

The production of carbon black for use on the factory front and on the battle front is a responsibility of the United Carbon Company. That this vital product shall be the finest that this company's resources and man-power can produce, is our Victory Pledge.

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SEMI-REINFORCING CARBON BLACK.

NEW EQUIPMENT

Taylor Fulscope Time Schedule Controller

Maintaining exact temperature, pressure, flow or liquid level according to a predetermined time schedule is the duty of the new Taylor Fulscope Time Schedule Controller. After the ideal processing schedule has once been determined, it is possible, with this new Taylor instrument, to automatically and precisely repeat the process as many times as desirable. The cam and the chart are individually mounted and conveni-

ently located for instant visual comparison on this latest development of the Taylor Instrument Companies, Rochester, N. Y. Incorporated with the Fulscope Controller, the Taylor Fulscope Time Schedule Controller presents many improved features, among them: friction drive cam assembly which permits rotation of the cam without loosening any locking means; improved means of resetting one cam without disturbing the other in an instrument with two complete control mechanisms; each cam capable of operating from one to four air valves, micro-switches or both for the actuation of any external mechanism such as a valve, bell or light, and do this automatically in any desired relation of one to the other; and the automatic return of the cam to the starting position.

An optional feature of this new time schedule controller is the "Interrupter Timer" which allows extreme flexibility to both the rise and the holding periods of the process under control. This timing feature allows the use of a very fast cam clock for a rapid rising period, but reduces the speed of the clock to increase the length of the holding period. The rising period, the holding period, or both, may be increased as much as 6½ times normal period with this new timer. It is built right in the time schedule controller, eliminating the need for a separate timing controller.

The new Taylor Time Schedule Controller is available in all control forms, including automatic reset and pre-act. By the addition of pre-calibrated assemblies it can easily be converted to fit any process requirements which might arise in the future. Universal case for face or flush mounting.

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Plant & Laboratory: Wilmington, Del.

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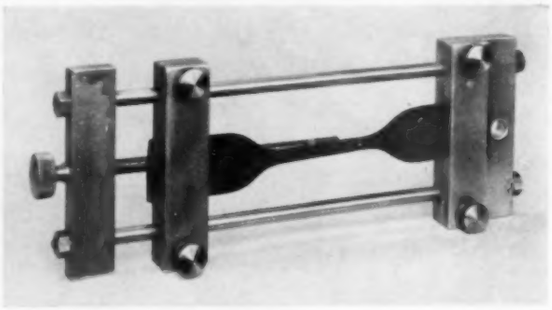
Rubber Holder for Light Aging

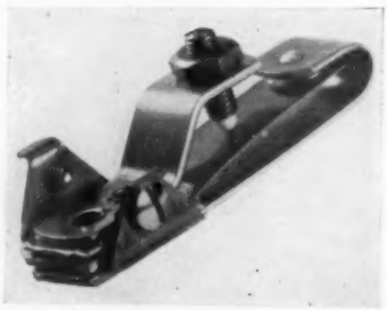
The specimen holder illustrated herewith is accurately constructed in conformity with the specifications set forth by the A.S.T.M. Subcommittee XV of Committee D-11 on Rubber Products in charge of the



resistance-to-light test. The purpose of the test is for estimating the resistance of compounds to deterioration from exposure to light. Specimens are exposed to radiation from a flaming carbon arc, with intermittent water spray. Deterioration is measured by comparing tensile strength and ultimate elongation with untreated specimens, and by observing the nature and extent of any cracking. The quantity of radiation is measured by the decomposition of uranyl oxalate solution. The specimen holder illustrated, made by the Henry L. Scott Co., Providence, R. I., assures uniformity of exposure during the test, which is now covered in Federal Specification ZZ-R-601a. It also provides for stretching the specimen to elongation up to and including 20%.

Ulanet Adjustable Thermostat

An approved adjustable thermostat, which is said to be especially adapted for use on rubber vulcanizing equipment, electrically-heated cabinets, temperature alarms, etc., has been developed by the George Ulanet Co., 88 East Kinney St., Newark, N. J. Known as Type ASK-BB, the sturdily built element has large



silver contacts. The assembly comprises a ½-inch bimetal element. With a maximum operating temperature of 300, 450 or 700° F., the unit is capable of handling 1500 watts at 150 or 230 volts a.c. It can be supplied in either normally open or closed type. The temperature setting is increased by turning a simple adjusting screw clockwise.

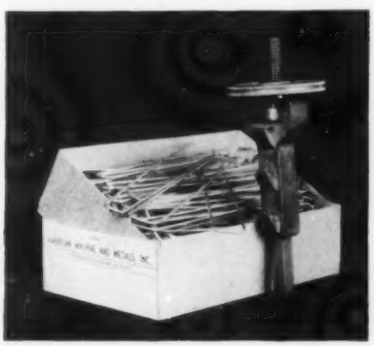
Edi Trimming Machine

A new type of hand trimming machine, which is said to find application in the cutting and trimming of rubber, heavy cloth, leather, cardboard forms, blueprints, etc., was recently developed by Edi Trimming

Machines, 611 West 112th St., New York City. The trimmer requires no maintenance since old razor blades are used for cutting. In operation, the material to be trimmed is held firmly in place by spring hinges on the rail guide. Cutting is performed by two razor blades held on a sliding block and secured in place by nuts in a protected arrangement. The table is calibrated to provide margins around the frame from 1/8th to 2 inches. The trimmer is made in four sizes to cut material from 25 to 55 inches.

Universal Hose Tool

A new method whereby clamping of rubber or fabric hose to metal couplings is quickly and simply done with loop-like bands of welded wire and a small tool has been announced by American Machine and Metals, Inc., East Moline, Ill. The tool, known as the Universal Hose Tool, makes couplings in three simple operations, requiring only a few minutes to do a job previously requiring hours. The tool bends the hose



band around the hose and then, by turning a small wheel and pushing forward, the band is clinched firmly, leaving a sturdy, permanent connection. The tool is made in small and large sizes and is recommended for liquid, gas and air hose couplings.

To the trade:

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REVIEWS

BOOKS

Industrial Chemistry of Colloidal and Amorphous Materials. By Warren K. Lewis, Lombard Squires, and Geoffrey Broughton. Published by The Macmillan Co., 60 Fifth Ave., New York City. 6¼x9¼ in. 540 pp. $5.50.

This book is a comprehensive text on the industrial chemistry of colloidal and amorphous materials, including rubber, paper, leather, ceramics, textiles, and synthetic resins and plastics. It accomplishes a double purpose in that it not only gives the reader a description of the methods practiced in various industries but also gives him an insight into the underlying phenomena so that he can appreciate the potentialities and limitations of processes and materials in that industry. Thus, it serves to develop the reader's capacity for controlling and using certain processes and materials, presuming that the reader has a background of chemistry and is concerned with the handling of colloidal and amorphous materials.

As an indication of the treatment given to the various industries using the materials covered by the book, the chapter on rubber can be used as an excellent example. This chapter contains data on latex, chemical properties of rubber, physical properties of raw rubber, milling, vulcanization, accelerators, fillers and reinforcing agents, production from latex, and aging. Data on reclaimed rubber and what the authors term artificial rubber is also included. The change which occurs in rubber from collection to finished product is ably told. Industrial applications are confined to the latter portion of the book, the first part being devoted to the presentation of basic material, including such subjects as structure of liquids, viscosity, surface tension, adsorption, the electrochemical behavior of colloids, etc.

The book is an outgrowth of personal, practical experience which covers a 30-year period. It embodies the results of 25 years teaching the subject at M.I.T. It contains 21 chapters and a comprehensive subject index. Brief bibliographies, which are intended to give an introduction to the literature that will emphasize the breadth of the various fields and the differences in approach, follow each chapter.

•

The Technology of Natural Resins. By C. L. Mantell, C. W. Kopf, J. L. Curtis, and E. M. Rogers. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York City. 6 x 9 in. 506 pp. $7.00.

This book fills the gap in the literature concerning the technology of certain of the natural resins, including damar, copal, East India, and related resins, as well as of their properties, their applications, industrial uses and development. The treatment throughout the book is more practical than theoretical or even scientific. The place of the natural resins in commerce is continually stressed. The book has 26 chapters, complete author and subject indexes, and a valuable appendix which includes native designations of natural resins.

•

Chemical Dictionary. Compiled by F. H. Campbell. Published by Chemical Publishing Co., Inc., 234 King St., Brooklyn, N. Y. 5½ x 8½ in. 85 pp. $2.50.

This is a compact dictionary which meets the demand for a low-priced reference work giving in condensed form essential information. Practically all chemical terms most commonly used are included. In all, some 1,000 chemical terms are defined. Drawings are used wherever possible to broaden the definition and enable the tyro in chemistry to grasp it fully.

BOOKLETS, CATALOGS, Etc.

Directory of Strategic and Essential Materials Available in Latin America. Prepared by J. J. Berliner & Staff, 225 Fifth Ave., New York, N. Y. 9 x 11½ in. 68 pp. Mimeographed. $12.50.

According to the compiler's announcement, this "directory" describes all the important materials urgently needed in the United States and gives the leading suppliers of these materials in Latin American countries. The materials mentioned include rubber, copper, zinc, sisal, cork, oils and hides. Actually, however, it is a composite list of all types of companies manufacturing, mining, distributing, jobbing, exporting, and generally handling such materials.

Unfortunately, it is impossible to tell from the listings as to which branch of the industry any particular company belongs, no key of any kind being used in the entire list, all companies being listed by country under the various material headings. It is also apparent that the lists are far from complete, since in the case of rubber, only those companies in Argentina, Bolivia, Brazil and Ecuador are listed. There are certainly rubber manufacturers, jobbers, exporters, importers, etc., in other of the Latin American countries, including Chile, Cuba, Mexico and Peru.

In view of the increasing interest in Latin American trade this list is of some value, but it is to be regretted that the compilers did not see fit to classify the companies listed and failed to make it more nearly complete.

•

Index of X-Ray Diffraction Data. Published by American Society for Testing Materials, 260 So. Broad St., Philadelphia, Penna. Packed in finished container boxes. $50.00 per set.

This index of X-ray diffraction data, for use in the Hanawalt method of chemical analysis by X-ray diffraction, is offered in the form of a 4,000-card file. The compilation is sponsored by a joint committee of the A.S.T.M. and the National Research Council. The data includes not only Hanawalt's original published data, with his later corrections, but also additional data contributed by the Aluminum Co. of America and the N. J. Zinc Co., together with data taken from the technical literature in the English language. The cards give all pertinent data found in the sources with provision for insertion of accessory data, such as crystal structure, density, etc. The index identifies the three strongest lines in the X-ray diffraction pattern of some 1,300 crystalline compounds, the chemical names and symbols of which are as given by the various sources.

•

The Mill Room of the Future. (Bulletin No. 178). Farrel-Birmingham Co., Inc., Ansonia, Conn. 8½ x 11 in. 18 pp.

Many developments in the preparation and processing of rubber have occurred in recent years. Based on these developments it seems certain that additional changes may be expected in the future. The Farrel-Birmingham Company visions an eventual mill room in which the raw material of the rubber industry will no longer defy automatic conveying, weighing and mixing. This "vision" has been interpreted in the motion picture "Robots and Rubber" made by the company, which has been seen by chemists in various parts of the country, and in a series of three articles published last year in the *India Rubber World*. This booklet is a reprint of those three articles, which discussed pellet rubber, progress in compounding room practices, and the mill room of the future, respectively. A flow chart of the theoretical mill room is included.

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REVIEWS (CONT'D)

Subcontracting for Defense. Policyholders Service Bureau, Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y. 8½ x 11 in. 68 pp.

Since production is so vital a problem today, any information which contributes to increased efficiency should be welcomed by every company handling defense work and manufacturers who want to obtain such work. This report, prepared in the interest of stabilizing employment, outlines the methods followed by 28 companies that have been outstandingly successful in meeting the problems of prime contracting or subcontracting. It includes a section on obtaining prime contracts for various types of supplies and equipment required by the government; describes sources of information on governmental requirements and on procurement set-up and procedure; discusses the administration of and responsibility for subcontracting in the prime contractor's organization and shows a variety of sources which primary contractors use to locate and contact subcontractors.

•

Wire Insulation Compounding. (Report No. 4112-4). Naugatuck Chemical Division, U. S. Rubber Co., 1230 Sixth Ave., New York, N. Y. 7 x 9¾ in. 24 pp.

This report, a condensation of results obtained in the Naugatuck laboratories over a period of years, is divided into three sections, the first containing specific recommendations for important types of wire insulation, the second giving complete compounds and data from plant or laboratory runs supporting these recommendations, and the third offering general recommendations involving accelerators, antioxidants, and special materials intended to serve as a guide for compounds beyond the scope of the text. Superaging R.H. wire, POSJ insulation, and code wire insulation are among the specific products discussed. A supplement included with the report discusses the new type R insulation which is currently being considered to replace present types R, RH and RP in some instances.

•

Analytical Methods in Rubber Chemistry. IV. Determination of Peroxidic Oxygen. By J. L. Bolland, A. Sundralingam, D. A. Sutton and G. R. Tristram. British Rubber Producers' Research Association, 19 Fenchurch St., London, E.C. 3, England. 5½ x 8½ in. 4 pp.

This bulletin describes a modification of the colorimetric method of Young, Vogt and Nieuwland for the determination of peroxidic oxygen in oxidized rubber. The method depends on the estimation of the color developed by ferric thiocyanate in methanol in the presence of sulfuric acid. The procedure for substances soluble in methanol is outlined. Results of the tests are given.

•

Rubber Molds for Making Castings. (Bulletin No. D-139). Technical Service Bureau, Inc., 407 So. Dearborn St., Chicago, Ill. 8½ x 14 in. 9 pp. Mimeographed. $1.00.

Instructions for preparing original models, making the rubber molds from the models, and making castings in the completed molds are given in this bulletin, one of a "how to" series prepared by the Technical Service Bureau. Data on casting ornamental and useful articles from liquid plastic, magnesite and other materials is also given. Sketches are used illustrate the process of making molds. All information given is said to have been tested and approved in the laboratories maintained by the publishers.

•

The part being played in the war effort by the various subsidiaries of the Baldwin Locomotive Works, Philadelphia, Penna., including the Baldwin Southwark Division, is pictorially told in "The Baldwin Group in Production for Defense," a colorful booklet recently issued by the parent company.

Spheron in Reclaim Tread Stocks. By F. H. Amon and H. H. Offutt. Godfrey L. Cabot, Inc., 77 Franklin St., Boston, Mass. 8½ x 11 in. 24 pp.

Results of a series of laboratory tests of reclaim tread stocks incorporating various representative grades of Spheron Carbon Black conducted in the Cabot laboratories are given in this technical bulletin. Abrasion, flex cracking, plasticity and conductivity results at various Spheron loadings are included. The bulletin is divided into five sections. Section 1 covers the purpose and scope of the work; compounding, mixing, curing and testing procedures: and summary and interpretation of results. The other sections are devoted to formulas, containing varying amounts of crude rubber and reclaim, with composition of stocks, test results and flex cracking photographs shown in each case.

•

Reclaim Reinforcement. (Chat No. 27). Binney & Smith Co., 41 East 42nd St., New York, N. Y. 8½ x 11 in. 2 pp.

The necessity of adding colloidal carbon to reclaim mixes to revitalize reclaimed rubber, is discussed in this "chat." Reference is made to compounding studies on the carbon loading of whole tire reclaim which indicate that the black already present is inadequate, thus demonstrating the need for reinforcement. According to the report, whether blended with new crude or used straight, the requirements for colloidal carbon reinforcement of reclaimed rubber fall closely in line with ratios well established for use with new rubber.

•

Index to A.S.T.M. Standards. Issued by the American Society for Testing Materials, 260 So. Broad St., Philadelphia, Penna. 6 x 9 in. 196 pp. No Charge.

In addition to being essential to the use of the A.S.T.M.'s Book of Standards and its two supplements for 1940 and 1941, this index is also of particular service to those who wish to determine whether the Society has issued standard specifications, test methods, or definitions covering a particular engineering material or subject. A list is given of the 1043 specifications and tests in numeric sequence of their serial designations. All items in the index are listed under appropriate key-words according to subjects they cover.

BRIEFS.....

The complete line of **Tag Celectray Electric Thermometers and Pyrometers** made by the C. J. Tagliabue Mfg. Co., Park and Nostrand Avenues, Brooklyn, N. Y., is described and illustrated in Catalog No. 1101G, recently issued by the company.

How the **Doall Contour Machine** for band sawing, band filing and polishing is aiding mass production is effectively told in words and pictures in "Doalls on Production," issued by Continental Machines, Inc., Minneapolis, Minn.

Possibilities of substituting various forms of **glass** for strategic materials no longer available are discussed by the Pittsburgh Plate Glass Co., Pittsburgh, Penna., in "Glass and Its Adaptability to Modern Needs."

Listings of numerous **new gauges, gauge cases and gauges for special services** are contained in a new 64-page catalog (Catalog 1000) issued by Manning, Maxwell & Moore, Inc., Bridgeport, Conn. Various gauge testers are illustrated.

Practical information concerning **pump adaptation** for a wide range of duties under varying conditions is the theme of a new industrial catalog (Bulletin No. 29-A107) published by the Pomona Pump Co., Pomona, Calif. Illustrated case histories are included.

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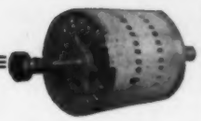
Stearns magnetic clutches and brakes offer smooth, efficient operation with near or remote control. Bulletin 225.



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One of the sure ways to conserve rubber is to make rubber articles last longer. Toward this end the makers of Johnson's Wax have formulated a group of special wax finishes for rubber goods.

These finishes protect rubber articles with a non-porous wax film that retards deterioration by preventing oxidation.

Johnson's Wax Finishes have already been used with great success on auto parts, vacuum cleaner parts, stair treads, rubber-covered wire, toys and many other products. In addition to preventing or retarding oxidation, the finishes also contribute a natural, long-lasting high lustre.

Because of great coverage (approximately 2,000 feet per gallon, or higher), Johnson's Wax Finishes are extremely economical to use. May be applied by dipping, spraying or wiping onto surface. Available in 5 and 55 gallon drums, and in 1 gallon cans.

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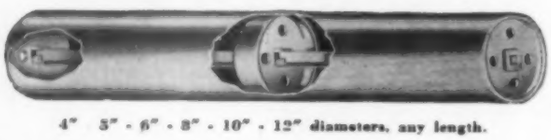
RUBBER DAM & BANDAGES — SHEET GUM

RAND RUBBER CO. BROOKLYN, N. Y. U. S. A. MFRS.

AIR BAG BUFFING MACHINERY
STOCK SHELLS — HOSE POLES
MANDRELS

NATIONAL SHERARDIZING & MACHINE CO.
868 Windsor St. Hartford, Conn.
Representatives: Akron San Francisco New York

New and Better
GAMMETER'S
ALL STEEL — ALL WELDED
CALENDER STOCK SHELL



4" - 5" - 6" - 8" - 10" - 12" diameters, any length.

Besides our well known Standard and Heavy Duty Constructions, we can supply light weight drums made up to suit your needs.

THE W. F. GAMMETER COMPANY
CADIZ, OHIO

The CARTER BELL MFG CO

CARTER BELL 1903 RUBBER SUBSTITUTES

Springfield New Jersey

WANT ADS

RATES: Five cents per word, minimum charge $2.00, except POSITIONS WANTED, $1.00 for 40 words or less, extra three cents per word. All classified advertisements payable in advance. Address replies to box numbers care of RUBBER AGE, 250 West 57th St., New York.

POSITIONS WANTED

CHEMIST—with over 14 years' experience in rubber research and compounding, including development of synthetic rubbers and their processing and compounding. Have full knowledge of development and manufacture of tires, mechanicals, proofed goods, latex and latex sponge, dipped goods, etc. Age 38. Available immediately. Address Box 1230, RUBBER AGE.

HELP WANTED

EXECUTIVE ENGINEER—Man who has had experience in the manufacture of rubber boats for the Army and Navy to take full charge of a boat building department in eastern rubber factory. He must be capable of interpreting government specifications and blueprints, designing and developing methods of manufacture, directing and training personnel. Unlimited opportunity for man of ability with initiative and experience. State age, nationality, experience and earnings. Address Box 1231, RUBBER AGE.

MECHANICAL GOODS SUPERINTENDENT OR GENERAL FOREMAN—Must be familiar with all operations and able to handle labor satisfactorily. Excellent opportunity with old established rubber company. State age, education and complete experience first letter. Address Box 1228, Rubber Age.

SUPERINTENDENT—Man with thorough experience, capable of setting up and supervising plant for the purpose of combining fabrics. Must have good knowledge of rubber spreading. Familiarity in working with gutta percha desirable. Good opportunity for right man. Only those with above knowledge need apply. Address Box 1232, RUBBER AGE.

EQUIPMENT WANTED

RUBBER MILLS, laboratory or production size, good condition. Address Box 1235, RUBBER AGE.

EQUIPMENT FOR RUBBER ERASER PRODUCTION. Mixer, automatic cutter, marking machine, drums, sieves, all perfect condition, detailed offer. Address Box 1236, RUBBER AGE.

WANTED—DEVULCANIZER (Pan Cooker). Minimum 6 to 8 feet diameter—15 feet long. Must carry minimum 150 pounds steam pressure. Require for immediate delivery. Must be in good condition. Address Box 1233, RUBBER AGE.

WANTED: 1—Banbury Mixer; 2—Mills; 1—Calender; 5—Hydraulic Presses, with pump and accumulator; 2—Tubers. Address Box 1014, RUBBER AGE.

BUSINESS OPPORTUNITIES

Due to travel difficulties, have you considered a Boston office to represent your interests in the New England rubber trade? Will operate on fee or commission basis. Address Box 1234, RUBBER AGE.

FOR SALE OR LICENSE on Royalty Basis. Improved internal mixer covered by recent U. S. patent. This mixer has many advantages over anything now on the market. Rubber compounders and Plastic manufacturers should investigate. Address Box 1229, Rubber Age.

FOR SALE

FOR SALE: 1—Watson-Stillman, Hydro-Pneumatic Accumulator; 1—5 ft. dia. Vulcanizer, with quick opening door; 5—Semi-Automatic Hydraulic Presses; 1—Farrel-Birmingham 16" x 36" Rubber Mill, m.d.; 1—Royle ½" Tuber; Hydraulic Pumps, Calenders, Tubers, etc. CONSOLIDATED PRODUCTS CO., INC., 14 Park Row, New York, N. Y.

MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, MAY 11, 1942

Crude Rubber

SINCE the major supplies of crude rubber, other than shipments from Ceylon and Africa, will now come from South America, official Washington has turned its full attention to increasing shipments from that country. Special pacts have already been signed between the Rubber Reserve Company and Brazil, Peru and Nicaragua. Others are pending and will be announced shortly.

The terms of most of these pacts, including that with Brazil, provide that the United States shall receive all raw rubber beyond that needed by the rubber manufacturing industry in the respective countries. The pacts run for a five-year period and, of course, will be renewed if the war is continued beyond that period. Prices to be paid for the rubber vary with the difficulties faced by each country.

On April 30 it was announced that an agreement had been reached with Brazil to establish a price of 39c a pound, f.o.b. Belem, for washed and dried Upper Acre Fine. Since this rubber will be brought into the United States by the Rubber Reserve Co. as sole purchaser, the latter company will set the domestic price. Thus far, no definite price structure for South American rubbers has been established.

Although there is doubt expressed in many quarters as to the amount of rubber which can be secured from Latin America, some holding that the past history of that area argues against any great increases in shipments despite prices which may be paid for the rubber, reports from several countries are encouraging. Large loads of rubber are said to be arriving at Belem and at Puerto Ayacucho in Venezuela. Nicaragua promises to step up shipments in the immediate future. All of these countries are urging Indian tribes to again start tapping wild trees, offering cash instead of promises.

In the meantime, domestic development of guayule is proceeding at a rapid pace with approximately 750 acres at Salinas devoted to nurseries where 500,000,000 seedlings will be grown for transplanting to from 45,000 to 50,000 field acres in 1943. It has also been learned that six tons of *Kok-Saghz* seedlings have been sent from Russia by boat for trial plantings in this country.

Quotations given below are those set by the Rubber Reserve Company:

As of May 11

Fixed Government Prices

Plantations—

Ribbed Smoked Sheets—

No. 1 Spot	—	@	.22½
No. 2	—	@	.22¼
No. 3	—	@	.22
No. 4	—	@	.21¾
Thin Latex Crepe	—	@	.23 7/8
Thick Latex Crepe	—	@	.23 7/8
Brown Crepe, No. 1	—	@	.21 3/8
Brown Crepe, No. 2	—	@	.21 1/8
Amber Crepe, No. 2	—	@	.21 3/8
Amber Crepe, No. 3	—	@	.21 1/8
Brown Crepe, Rolled	—	@	.17 1/8

Latex—

Normal, carload lots, tanks	—	@	.2595
Normal, carload lots, drums	—	@	.2825
Conc., carload lots, tanks	—	@	.2765
Conc., carload lots, drums	—	@	.2950

Outside Market Prices

Paras—

Up-River, fine	—	@	—
Acre Bolivian, fine	—	@	—

Balata—

Brazilian block	—	@	—

Scrap Rubber

Scrap rubber collections continue poor with dealers doing their best to drive accumulations into market channels but with no remarkable results to date. It is definitely known that a national scrap collection drive is being organized in Washington and the probability is that it will be headed by Willard Helburn, former chief of the Rubber Branch of the War Production Board. In some quarters it is believed that the government will organize a "Scrap Rubber Reserve Co." which will purchase all scrap and allocate it to the reclaimers. The scrap company, it is further believed, will absorb freight costs if present ceilings are maintained. Early action is predicted. Prices shown below are ceiling prices.

(Prices to Consumers, Delivered Akron)

Mixed passenger tires	ton	18.00
Beadless passenger tires	ton	24.00
Passenger S.A.G.	ton	18.50
Mixed truck tires	ton	18.00
Beadless truck tires	ton	24.00
No. 1 truck S.A.G.	ton	16.50
No. 2 truck S.A.G.	ton	16.50
No. 1 passenger peelings	ton	47.50
No. 2 passenger peelings	ton	30.00
No. 3 passenger peelings	ton	27.50
No. 1 truck peelings	ton	47.50
No. 1A truck peelings	ton	50.00
No. 2 truck peelings	ton	30.00
No. 3 truck peelings	ton	27.50
No. 1 light colored carcass	ton	52.50
No. 2 light colored carcass	ton	50.00
Gray carcass	ton	47.50
No. 2 passenger tubes	lb.	.07¾
No. 2 passenger tubes, lt. col.	lb.	.08¼
Red passenger tubes	lb.	.07½
Black passenger tubes	lb.	.06¾
Mixed passenger tubes	lb.	.06¾
No. 2 truck tubes	lb.	.07½
Red truck tubes	lb.	.07¼
Black truck tubes	lb.	.05¼
Two-toned black-gold tubes	lb.	.06¾
Two-toned red-black tubes	lb.	.06½

Tire Fabrics

The situation in the tire fabric field remains unchanged, with practically no demand for such fabrics. Consequently, prices are nominal and in many quarters are not even being quoted. The prices shown below are those which were in force on or about January 15.

(Prices Net at the Mill)

Peeler, carded, 23/5/3	lb.	.43½ @	.44
Peeler, carded, 23/4/3	lb.	.44½ @	.45
Peeler, carded, 15/3/3	lb.	.41½ @	.42
Peeler, carded, 15/4/2	lb.	.41½ @	.42
Peeler, carded, 13/3/3	lb.	.40½ @	.41

CHAFERS

Carded, American, 1 1/16"	lb.	.43½ @	.44
Carded, American, 1"	lb.	.39½ @	.48

Sheetings

48x40	36 in.	5.50	lb.	—	@ 7.818
40x40	36 in.	6.15	lb.	—	@ 6.991
40x36	36 in.	6.50	lb.	—	@ 6.615
48x48	40 in.	2.50	lb.	—	@ 16.200
48x48	40 in.	2.85	lb.	—	@ 14.210
56x60	40 in.	3.60	lb.	—	@ 11.944
48x44	40 in.	3.75	lb.	—	@ 11.066

Note: Prices shown above are ceiling prices set by order of the O.P.A. Quotations are based on an average price of 15-16-inch middling cotton of 20.37c at the ten designated southern markets.

Cotton

The spot cotton price has moved in a narrow 55 point range since our last report, high being 21.20 on April 16 and low 20.65 on April 28. Starting with a price of 21.14 on April 13 the price dropped sharply to 21.03 the following day due to hedging operations but climbed to 21.20 on April 16 as the result of active trade support. Hedges and liquidation again forced the price down while buyers, feeling that the Administration was determined to check price advances, were extremely cautious. This feeling of apprehension continued for some time and the price continued falling slowly but steadily, touching 20.65, low for the period, on April 28. Return of healthy trade and mill demand started an upward movement, and the price climbed back to 21.00 on May 5, dipped slightly the following day, and then went up to 21.15 on May 8. As a result of W.P.B.'s mill conversion order the rate of domestic cotton consumption is expected to reach new record highs in the next few weeks. Quotations for middling uplands on the Exchange follow:

	April 13	May 11		
	Close	High	Low	Close
May	19.47	19.35	19.28	19.28
July	19.60	19.63	19.53	19.53
October	19.76	19.91	19.81	19.83

Reclaimed Rubber

Because of the restrictions and regulations on the manufacture of rubber products issued by the War Production Board uses of reclaim are constantly shifting but the demand continues at a high rate. The reclaiming industry is facing a serious problem on scrap supply and the point has been reached where some of the reclaimers have been required to curtail production. Considerable attention is being paid by Washington to the supply problem but nothing definite has yet been formulated. Reclaimers believe that voluntary actions will not meet the supply problem and punitive measures may have to be adopted to bring scrap out into the open. There is considerable discussion as to the proper classification of so-called low-grade reclaim advanced by one of the larger reclaimers. Prices shown below, for carload and less than carload shipments, are ceiling prices:

Shoe

Unwashed	lb.	.07 @	.07¼

Tube

Black Tube	lb.	.11¼ @	.11½
Red Tube	lb.	.12 @	.12¼

Tires

Black (acid process)	lb.	.07½ @	.07¾
Black, selected tires	lb.	.06½ @	.06¾
Truck, Heavy Gravity	lb.	.08½ @	.08¾

Miscellaneous

Mechanical blends	lb.	.04½ @	.05½
White	lb.	.13 @	.13¼

Ducks

Enameling (single filling)	lb.	.44 @	.45
Belting and Hose	lb.	— @	.36½
Single filling, A grade	lb.	.20 @	.21
Double filling, A grade	lb.	— @	.21½

CHEMICAL MARKETS

New York, May 11, 1942
All Prices F.O.B. Works

ACCELERATORS

Organic

A-1 (Thiocarbanilid)	lb.	.28 @	.33
A-10	lb.	.36 @	.42
A-11	lb.	.52 @	.65
A-19	lb.	.52 @	.65
A-32	lb.	.60 @	.70
A-77	lb.	.42 @	.55
A-100	lb.	.42 @	.55
Aldehyde ammonia, crystals	lb.	.65 @	.70
Altax	lb.	.45 @	.50
Beutene	lb.	.60 @	.65
B-J-F	lb.	.50 @	.55
Butyl Zimate	lb.	— @	1.15
Captax	lb.	.40 @	.47
Crylene	lb.	.40 @	.47
Di-Ortho-Tolyguanidine	lb.	.44 @	.46
Diphenylguanidine	lb.	.35 @	.45
El-Sixty	lb.	.40 @	.47
Ethyl Zimate	lb.	— @	1.15
Ethylidene aniline	lb.	.42 @	.43
Formaldehyde aniline	lb.	.31 @	—
Guantal	lb.	.40 @	.50
Hepteen	lb.	.35 @	.40
Hexamethylenetetramine	lb.	.33 @	—
Lead Oleate, No. 999	lb.	.13 @	—
Witco	lb.	.15 @	—
Methyl Tuads	lb.	— @	1.55
Methyl Zimate	lb.	— @	1.25
Monex	lb.	— @	1.55
Pentex	lb.	.75 @	.85
Phenex	lb.	.50 @	.55
Pip-Pip	lb.	— @	1.65
R & H 50-D	lb.	.42 @	.43
R-2	lb.	1.40 @	1.80
R-2 Crystals	lb.	1.55 @	1.70
Rotax	lb.	.50 @	.55
Safex	lb.	1.20 @	1.30
SPDX	lb.	.70 @	.75
Super-Sulphur No. 1	lb.	.50 @	—
No. 2	lb.	.14 @	.16
Thiocarbanilid, drums	lb.	.28 @	.33
Thiurad	lb.	— @	1.55
Trimene	lb.	.55 @	.65
base	lb.	1.05 @	1.20
Triphenylguanidine	lb.	.45 @	—
Ultu	lb.	1.25 @	1.75
Ureka	lb.	.50 @	.57
Blend B	lb.	.50 @	.57
Blend C	lb.	.48 @	.55
Vulcanex	lb.	.42 @	.43
Vulcanol	lb.	.85 @	—

Inorganic

Litharge, domestic	lb.	.07 @	.07½
Magnesia, calcined, heavy	lb.	.04 @	—

COLORS

Blacks (See Next Column)

Blues [b]

Prussian	lb.	.36 @	—
Ultramarine	lb.	.16 @	.27

Browns [b]

Mapico	lb.	.11 @	—
Umber, Turkey	lb.	.04¾ @	.05½

Greens [b]

Chrome	lb.	— @	.25
Guignet's Green	lb.	.70 @	—

Reds

Antimony crimson, 15/17	lb.	— @	—
sulfur, free	lb.	— @	—
Indian	lb.	.08¾ @	—
Domestic (Maroon)	lb.	.11 @	—
Mapico	lb.	.09¾ @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red	lb.	.09¼ @	—

Whites [b]

Cryptone No. 19	lb.	.0560 @	.0585
Cryptone CB No. 21	lb.	.0560 @	.0585
Cryptone ZS-800	lb.	.0825 @	.0850
Lithopone:			
Albalith	lb.	.04¼ @	.04½
Astrolith	lb.	.04½ @	.04½
Azolith	lb.	.04¼ @	.04½
Ray-cal	lb.	.05½ @	.05¾
Rayox	lb.	.14½ @	.15¼
Titanox A	lb.	.14½ @	.14¾
Titanox B	lb.	.05¾ @	.06
Titanox C	lb.	.05½ @	.05¾
Zinc Oxide—American Process [b]			
American Azo: ZZZ (lead free)	lb.	.07¼ @	.07½
Anaconda, lead free	lb.	.07¼ @	.07½
Horsehead Lead Free Brand:			
Special—3	lb.	.07¼ @	.07½
XX Red—4	lb.	.07¼ @	.07½
XX Red—72	lb.	.07¼ @	.07½
XX Red—103	lb.	.07¼ @	.07½
Kadox, black label—15	lb.	.07¼ @	.07½
Red label—17	lb.	.07¼ @	.07½
St. Joe, black label	lb.	.07¼ @	.07½
green label	lb.	.07¼ @	.07½
red label	lb.	.07¼ @	.07½
U. S. P.—7, bbls.	lb.	.10½ @	.10¾
Zinc Oxide—French Process: [b]			
Florence White Seal—7 bbl.	lb.	.09½ @	.09¾
Green seal—8	lb.	.09 @	.09¼
Red seal—9	lb.	.08½ @	.08¾
Yellows [b]			
Cadmolith	lb.	.55 @	.60
Chrome	lb.	— @	.50
Mapico	lb.	.07¼ @	—

[a] Price Ceilings.
[b] Price Suggestions or Agreements.

BLACKS
(In bags, carload lots)

Aerfloted Arrow	.0355 @	—
Certified	.0355 @	—
Certified Spheron	.0355 @	—
Continental	.0355 @	—
Disperso	.0355 @	—
Dixiedensed	.0355 @	—
Dixiedensed 66	.0355 @	—
Excello	.0355 @	—
Furnex	.03½ @	.06
Furnex Beads	.03½ @	.06
Gastex	.03½ @	.06
Kosmobile	.0355 @	—
Kosmobile 66	.0355 @	—
Kosmos-Dixie 20	.03½ @	.06
Micronex (Amarillo)	.0355 @	—
Micronex Beads (Amarillo)	.0355 @	—
Pelletex	.03½ @	.06
P-33	.0475 @	—
Shell Carbon (Del. Midwest)	.025 @	—
Supreme	.0355 @	—
Thermax	.0225 @	—
Wyex	.0355 @	—

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85	@24.50
Asbestine	ton	16.50	@20.00
Barium carbonate (98-100%)	ton	47.00	@49.00
Barytes	ton	25.35	@36.00
Bentonite	ton	11.00	@16.00
Blanc fixe, dry	ton	60.00	@67.50
Calcene	ton	37.50	@43.00
Catalpo (fact.)	lb.	.02 @	—
Chalk, precipitated			
Suprex white	ton	32.50	@45.00
Clay, Aerfloted, Suprex	ton	11.00	@23.50
Aerfloted Paragon	ton	10.00	@22.50
Crown (f.o.b. plant)	ton	11.00	@ —
Dixie	ton	11.00	@23.50
Langford	ton	—	@ 8.50
McNamee	ton	10.00	@22.50
Par	ton	—	@11.00
Witco	ton	10.00	@ —
Cotton Flock (Dark)	lb.	.10½ @	.13
Kalite No. 1	ton	26.00	@52.00
Kalite No. 3	ton	36.00	@62.00
Kalvan	ton	100.00	@126.00
Magnesium carbonate	lb.	.06¼ @	—
Mica	ton	35.00	@44.00
Mineralite	ton	—	@30.00
Pyrax A	ton	7.50	@20.00
Rottenstone (powd. Dom.)	ton	25.50	@37.50
Rubberol	lb.	.16 @	.16½
Silene (calcium silicate)	lb.	.04 @	.045
Starch, powdered	cwt.	2.90 @	4.10
Talc, domestic	ton	17.00	@25.00
Whiting, commercial	ton	16.00	@26.00
Columbia Filler	ton	9.00	@14.00
Witco	ton	6.00 @	—
Wood Flour (100 mesh)	ton	30.00	@32.00

MINERAL RUBBER

285°-300° Mineral Rubber	ton	25.00 @	—
Black Diamond	ton	25.00 @	—
Genasco, solid (factory)	ton	— @	—
Hard Hydrocarbon	ton	25.00 @	42.00
Parmr, solid	ton	— @	—
Pioneer, MR. solid	ton	— @	—

MISCELLANEOUS

Aromatics—Rodo #0	lb.	4.00 @	4.50
Rodo #10	lb.	5.00 @	5.50
Curodex 19	lb.	2.75 @	—
Curodex 188	lb.	3.50 @	—
Curodex 198	lb.	4.50 @	—
Para-Dors	lb.	4.50 @	—
Aresklene No. 375 (dispersing, wetting and penetrating agent)	lb.	.35 @	.50
Darvan (dispersing agent)	lb.	.30 @	.39
Santomerse S (dispersing, wetting, penetrating and stabilizing agent)	lb.	.11 @	.25
Sponge Paste	lb.	— @	.18
Sunproof	lb.	.23 @	.28
Tackol (tackifier)	lb.	.085 @	.18
Tonox	lb.	.52 @	.61
Ty-Ply R (and S)	gal.	6.75 @	8.75
Unicel (blowing agent)	lb.	.50 @	—

SOFTENERS

Acids			
Acetic, 28%, bbls. [a]	100 lb.	3.38 @	3.63
Nitric, 36 degrees	cwt.	5.00 @	—
Acids, Fatty			
Laurex	lb.	.15 @	.17½
SL #10	lb.	.12 @	.14
Stearex Beads	lb.	.10 @	.11
Stearic, double pressed	lb.	.12½ @	.13½
Stearite	lb.	.10 @	—
Alkalies			
Caustic Soda, 76%	cwt.	2.70 @	5.70
Soda Ash, 58%	cwt.	1.15 @	2.98
Oils			
Cycline Oil	gal.	.14 @	.20
Degras, bbls.	lb.	.12 @	.12¼
Para-Flux	gal.	.17 @	.18
Para-Lube	lb.	.046 @	.048
Petrolatum, amber [b]	lb.	.03½ @	.04½
Pigmentaroil, tank cars	gal.	.20½ @	—
in drums	gal.	.29 @	.30
Pine, steam distilled	gal.	1.20 @	—
Rosin Oil, cmpd.	gal.	.40 @	—
Rubberol	lb.	.13½ @	.14
Rubtack	lb.	.10 @	—
Seedine, c.l.	lb.	.07¼ @	—
Tackol	lb.	.08½ @	.18
Witco Palm Oil	lb.	— @	—
Witco Softener No. 20	gal.	.20 @	—
Woburn No. 8, c.l.	lb.	.06 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06 @	.06½
coal tar	ton	19.00 @	22.00
hardwood	ton	16.00 @	22.50
pine, 200 lb. gr. wt.	bbl.	6.00 @	6.50
Pigmentar, tank cars	gal.	.20½ @	—
in drums	gal.	.29 @	.30
Retort Pine Tar, drums	gal.	.29 @	.30
Solvents			
Acetone, pure [a]	lb.	.07 @	.173
Benzene, 90%, tank car	gal.	.14 @	—
Beta-Trichlorethane	gal.	— @	.20
Bondogen	lb.	.98 @	1.25
Carbon, bisulfide	lb.	.05 @	.08½
Carbon tetrachloride	gal.	.73 @	1.27
Dichlorethylene	lb.	— @	—
Dipentene, cml., drums	gal.	.48 @	.50
Ethylene dichloride	lb.	.07½ @	.08¼
Plastogen	lb.	.07¾ @	.12
Reogen (drums)	lb.	.11½ @	.15
Rub-Sol	gal.	.09½ @	—
Trichlorethylene	lb.	.08 @	.09½
Turpentine, spirits	gal.	.82 @	.86
dest. dist., drums	gal.	.60 @	.65
Waxes			
Beeswax, white [b]	lb.	.61 @	—
Carnauba, yellow [b]	lb.	.86 @	.88
Ceresin, white, dom.	lb.	.13½ @	.15
Montan, crude	lb.	.45 @	.46
Paraffin [a]			
Yellow crude scale, 124/126	lb.	.04¼ @	—
Refined, 123/125	lb.	.05¼ @	—

ANTI-OXIDANTS

Agerite Alba	lb.	2.00 @	2.15
Gel	lb.	.57 @	.59
Hipar	lb.	.65 @	.67
Powder	lb.	.52 @	.54
Resin	lb.	.52 @	.54
Resin D	lb.	.52 @	.54
White	lb.	1.25 @	1.40
Albasan	lb.	.70 @	.75
Antox	lb.	— @	.56
B-L-E	lb.	.52 @	.61
Flectol H	lb.	.52 @	.65
Flectol White	lb.	.90 @	1.15
Neozone A, B, C, D, E	lb.	.52 @	.63
Oxynone	lb.	.77 @	.90
Retardex	lb.	.45 @	.48
Santoflex B	lb.	.52 @	.65
Santovar A	lb.	1.15 @	1.40
S.C.R.	lb.	.33 @	.35
Stabilite	lb.	.52 @	.54
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.52 @	.61

EXTENDERS

Naftolen	lb.	.15 @	.25
Vanzak	gal.	.05 @	.06

LUBRICANTS—MOLD & RUBBER SURFACE

Aresklene	lb.	.35 @	.50
Cocoa Soapstock	lb.	.06 @	.08
Colite	gal.	.90 @	1.15
Dipex	lb.	.06 @	.08
Glycerized Liquid Lubricant	gal.	1.15 @	1.20
Lubrex	lb.	.25 @	.30
Mineralite	ton	— @	30.00
Mold Paste	lb.	.12 @	.18
Sericite	ton	65.00 @	75.00
Soap Tree Bark, cut, sifted	lb.	.06 @	.08

FACTICE OR RUBBER SUBSTITUTES

Amberex	lb.	.25 @	—
Amberex Type B	lb.	.18¾ @	—
Black	lb.	.08½ @	.13
White	lb.	.09 @	.15
Brown	lb.	.10 @	.14
Neophax A	lb.	.16½ @	—

VULCANIZING INGREDIENTS

Dispersed Sulfur No. 2	lb.	.08 @	.12
Sulfur Chloride, yellow (drs.)	lb.	.03 @	.08
Sulfur, rubber makers			
Refined (bags)	cwt.	2.40 @	—
Commercial (bags)	cwt.	2.05 @	—
Telloy	lb.	1.75 @	—
Vandex	lb.	1.75 @	—

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Industry.

The Market Place

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- Good Aging Properties
- Free from Rapid Overcure
- Safe Processing Properties
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99.75% 325 mesh, more than 90% minus 25 microns; soft, thin, platy particles, assuring better tensile, flexing and elongation.
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Cable Address: Jacobite Boston

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RUBBER CHEMICALS
DPG—DOTG—Accelerator 49
Rubber Sulphur
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CONTINENTAL COMPRESSED
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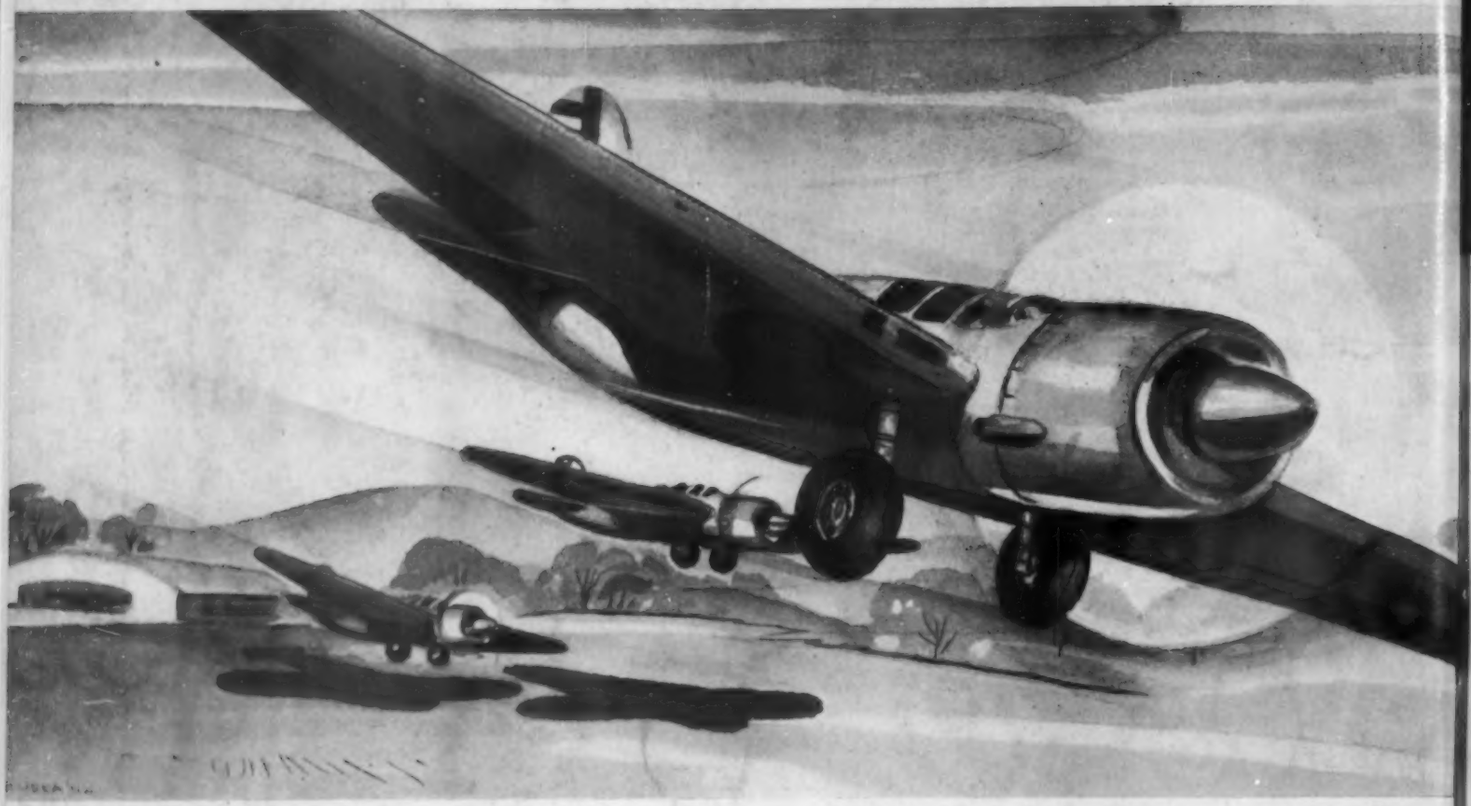

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